VOLUME ONE
A—BEOWULF

# THE BRITISH ENCYCLOPEDIA

IN TEN VOLUMES
ILLUSTRATED

# THE BRITISH ENCYCLOPEDIA

## ILLUSTRATED

With an Introduction by
CYRIL NORWOOD, M.A., D. Litt.,
Headmaster of Harrow

Prepared under the general editorship of J. M. Parrish, M.A. (Oxon.), John R. Crossland, F.R.G.S., and Angelo S. Rappoport, Ph.D., B. ès L., with the specialist assistance and contributions of over 100 experts

VOLUME
ONE

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# INTRODUCTION

By CYRIL NORWOOD, M.A., D.Litt.
*Headmaster of Harrow*

THE disillusioned Preacher at the end of his short treatise took occasion to tell subsequent generations that "of making many books there is no end; and much study is a weariness to the flesh." It is clear that he wrote before the days of encyclopedias and at a time when man might still strive to read all the books that had been written, and to hold in his head the sum of all human knowledge. Probably no one has been able to make this claim since the day of the elder Pliny, or more probably Aristotle, and it is to be noticed that both these men alomst instinctively became pioneers of the encyclopedia, and attempted to bring all knowledge within the compass of a written book. Certainly of making encyclopedias there has been no end in all the leading countries of the world; they have tended to grow bigger and bigger and to appear more and more frequently. They attempt to give what is nothing less than a cross-section of all knowledge at any given moment, and knowledge is advancing rapidly on a hundred frontiers all the time. Hence a new encyclopedia can never lack proper excuse. Size is not everything and it is better to be up to date than to be exhaustive. There is, for instance, a Chinese encyclopedia in over five thousand volumes which has held the record for bulk for three centuries, but it would be surprising if the copy in the British Museum is frequently consulted.

*The British Encyclopedia* has required the services of more than one hundred contributors, each of them authorities in their own subjects, to carry the work through to completion. And here is the result, five million words set out in a dozen volumes, claiming to be, as it is, the most modern of all the encyclopedias.

We live in an age of increasing momentum, when more than ever before time is valuable, and we wish to find out quickly and accurately whatever it is that we may want to know. For the great majority of modern men and women there are four definite characteristics which a rock of reference such as this should display: it should be accurate; it should be terse; it should be up to date; and it should be in a form which can be readily used. To all these tests *The British Encyclopedia* can challenge examination with confidence.

It is impossible within the scope of a brief introduction to submit to a full and impartial test the accuracy of a great encyclopedia, and the evidence of its exactness lies in the names of the scholars who have co-operated to bring it abreast of modern knowledge. The proof of that particular pudding must lie in the eating, but it has, at any rate, been prepared with skill. The next requirement of the busy worker is that the articles should be terse; he knows too well the sense of finding himself adrift in a slowly spreading pond of prolixity, in which there are for him no landmarks, or so many that he cannot find the particular one which he earnestly requires. In this book the writers go straight for the leading facts, and put them down clearly. One finds, for instance, under the heading of a person or a place, perhaps twenty salient pieces of information stated in fifteen lines, which in nine cases out of ten will give to the inquirer all that he wants. But in more important topics, if he wants more, he finds that a useful bibliography is added so that he knows to what further works of reference he can turn. And in a large number of instances he will find graphic methods employed, maps, diagrams, plans and pictures, so that by a glance of the eye he can follow the meaning of the text.

It is a work which is capable of being quickly and easily used. Twelve volumes do not take up an impossible space upon any one's shelves, and when you take down the appropriate part, you open upon pages which are very clearly printed, in short lines, well set out in double columns, so that they are both pleasant and easy to read. These may seem to some to be trivial details, but they are in reality highly important, as every one knows who has in his daily work frequent occasion to turn over the pages of a work of reference. This is emphatically a convenient work.

If a person is in the habit of using an encyclopedia he will need no words to persuade him of its utility. But if he is not, then, whether he is a professional man, or a business man, or a man of leisure, he cannot do better than use such a book as this, and form the habit. There is probably abroad to-day as much loose thinking and as much vague statements as ever before. How many are content to say such things as "I believe that it has something to do with that," or "I fancy he was a man who lived round about so-and-so," and to leave their impressions uncorrected and valueless. Dr. Johnson once wrote of the Englishmen of his day, "Some men relate what they think as what they know: some men of confused memories and habitual inaccuracy ascribe to one man what belongs to another: and some talk on without thought or care."

He would see no reason to be any less severe if he were alive to-day. The most valuable function of the encyclopedia is that it offers to all sorts of people the readiest means of classifying their impressions and of finding out what the facts really are. It is a very useful thing to get into the habit of saying "Let us see what the encyclopedia has to say about it!"

An encyclopedia is again a very profitable possession in any house where there are plenty of young people of an inquiring mind. It is not merely that children get into the habit of looking up their facts, and deriving them from an authoritative source. They also get into the way of browsing about an encyclopedia, and that is by no means a waste of time. They not only gather a great deal of knowledge without realising it (and there is, after all, no such thing as quite modern knowledge), but they also often come upon matters which rouse their interest, and make in them the desire to know more. There have been plenty of cases in which a life's interest, or a life's career, has started from what was originally little more than a chance scrutiny of the pages of an encyclopedia.

Again, most of us in these days are specialists, and often we are quite narrow specialists. If we have not the habit of reading, we are very apt to slip into the way of thinking that our own little patch of knowledge is all that supremely matters. We grow unsympathetic, and in proportion as we do that we become unintelligent. No one can turn over the pages of such a work as this

without having cause to reflect in his own mind on the enormous number of things which he does not know, and if he reads further, on the interesting character of many subjects of which he has only a shadowy impression. Not the least use of an encyclopedia is to give breadth of interest, and to drive home the salutary lesson of how infinitesimal is the part in the sum of human knowledge which is in the possession, and at the command, of one individual mind to-day.

All these utilities and opportunities can partly be said to be open to the owners of *The British Encyclopedia*; it is a work of which the producers may be proud. If I might quote Dr. Johnson again, it will be because one of his answers to Boswell fits here very aptly. Boswell had said to the great man that when he started his dictionary he did not know what he was undertaking. He received the crushing reply, "Yes, sir, I knew very well what I was undertaking, and saw well how to do it, and have done it very well." So, too, but for their modesty, might boast the editors of this work.

# EDITORS' PREFACE

IN planning *The British Encyclopedia* the Editors have borne in mind throughout the needs of the present day, when two factors are called for in the search for information. Knowledge must be sound, and at the same time it must be as full as is compatible with the short time often available for its perusal and assimilation. Five million words of such information have been gathered together from the accumulated knowledge of well over a hundred experts in various walks of life, work and scholarship, and this information has been checked with especial reference to facts and statistics. Every effort has been made to ensure that the whole is thoroughly up to date.

To use such an encyclopedia needs thought and system. The casual turning up of a wanted fact is often the most frequent need of the busy man or woman, but there is much more to be extracted from the pages of *The British Encyclopedia*. It gives its information in such an exhaustive way, and its matter has been so arranged within the individual articles that by means of cross-reference and the reading-up of associated entries the work may be used as a text book on almost any subject.

To take the instance of English Literature: first the general article is studied, and a list made of the salient features of the various periods and divisions. Another list of the writers who helped to build for us this heritage of joy, profit and culture might then be made and each writer studied through the entry that bears his name. Thus a continuous course is arranged for himself by the student, and when this is yoked to the articles on poetry, the novel, the play and other cognate entries, the true value of *The British Encyclopedia* as an aid to systematic study will be fully appreciated.

That the articles on important matters are full and informative will be gathered by a careful analysis of any such subject. Let us open Volume II. at the entry CHEMISTRY. Here we find that some twelve hundred lines of type have been devoted to the outline of the science, and that this outline, which is amplified by

countless other sectional articles, to which cross-references are given, carries the following sections: *History, Laws of Combination, Symbols and Formulæ, Table of Elements and their Atomic Weights, Valency, Classification of Chemical Substances, Inorganic Chemistry, Organic Chemistry, Bases, Physiological Chemistry and Analytical Chemistry,* with a full bibliography to assist a fuller study.

The thorough treatment afforded to outstanding figures of history and literature, in the same volume, may be gauged by turning to CHARLEMAGNE, who has over a hundred lines devoted to an account of his life and work, and an estimate of its value to the world, while the article on CHAUCER stands as a brilliant monograph of this pioneer of our literature.

The above examples of treatment serve to show the scope of this work, and it will be seen that, when a little instruction in tracking down a subject through its cross-references has been given by an adult, the volumes will be of invaluable assistance to young people engaged in study out of school. For the busy adult seeking quick information the division of major subjects into sub-sections with headings will be found of great value in saving time and trouble. The illustrations and maps will, it is hoped, form an acceptable adjunct to the letterpress.

Arguments often arise where people meet together in regard to the pronunciation of an unusual or a foreign word. *The British Encyclopedia* gives the method of pronunciation where necessary in parenthesis after the main entry word, and in the preliminary pages to each volume the Scheme of Pronunciation is clearly set down.

The charge often levelled against encyclopedias is that, in their text matter, they are apt to use words beyond the ken of the ordinary seeker after information. Though the language of the present work has been kept as simple as possible, there are times when necessarily the words and phrases used are somewhat difficult to the inexpert. The problem of such is solved in the case of *The British Encyclopedia* by the inclusion, in the final volumes, of an up-to-date and efficient dictionary, so that the stumbling blocks may be removed as soon as they present themselves.

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# KEY TO PRONUNCIATION

The method of marking pronunciations here employed is either (1) by marking the syllable on which the accent falls, or (2) by a simple system of transliteration, to which the following is the Key :

## VOWELS

ā, as in *f*a*te*, or in b*are*.

ä, as in *a*lms, Fr. â*me*, Ger. B*a*hn = á of Indian names.

ȧ, the same sound short or medium, as in Fr. b*a*l, Ger. M*a*nn.

a, as in *f*a*t*.

ą, as in *f*a*ll*.

*a*, obscure, as in rur*a*l, similar to *u* in b*u*t, ė in h*e*r : common in Indian names.

ē, as in m*e* = *i* in mach*i*ne.

e, as in m*e*t.

ė, as in h*e*r.

ī, as in p*i*ne, or as *ei* in Ger. m*ei*n.

i, as in p*i*n, also used for the short sound corresponding to ē, as in French and Italian words.

*eu*, a long sound as in Fr. jeûne = Ger. long *ö*, as in Söhne, Göthe (Goethe).

eu, corresponding sound short or medium, as in Fr. p*eu* = Ger. *ö* short.

ō, as in n*o*te, m*oa*n.

o, as in n*o*t, s*o*ft—that is, short or medium.

ö, as in m*o*ve, t*wo*.

ū, as in t*u*be.

u, as in t*u*b : similar to ė and also to *a*.

u̧, as in b*u*ll.

ü, as in Sc. ab*u*ne = Fr. *û* as in d*û*, Ger. *ü* long as in gr*ü*n, B*ü*hne.

u̇, the corresponding short or medium sound, as in Fr. b*u*t, Ger. M*ü*ller.

oi, as in *oi*l.

ou, as in p*ou*nd ; or as *au* in Ger. H*au*s.

# CONSONANTS

Of the *consonants*, **b, d, f, h, j, k, l, m, n, ng, p, sh, t, v, z,** always have their common English sounds, when used to transliterate foreign words. The letter **c** is not used by itself in re-writing for pronunciation, **s** or **k** being used instead. The only consonantal symbols, therefore, that require explanation are the following :

ch is always as in ri*ch*.

*d*, nearly as *th* in *th*is = Sp. *d* in Ma*d*ri*d*, etc.

g is always hard, as in *go*.

*h* represents the guttural in Scotch lo*ch*, Ger. na*ch*, also other similar gutturals.

n̨, Fr. nasal *n* as in bo*n*.

r represents both English *r*, and *r* in foreign words, which is generally much more strongly trilled.

s, always as in *so*.

th, as *th* in *th*in.

*th*, as *th* in *th*is.

w always consonantal, as in *we*.

x = ks, which are used instead.

y always consonantal, as in *y*ea (Fr. *ligne* would be re-written lēny).

zh, as *s* in pleasure = Fr. *j*.

# THE BRITISH ENCYCLOPEDIA

## VOLUME I

**A.** The first letter in many alphabets. The sound most commonly belonging to it, as in French, Italian, German, etc., is that which is heard in *father*, pronounced short or long. In English the letter is made to represent at least seven sounds, as in *father, mat, mate, mare, many, ball, what*, besides being used in such digraphs as *ea* in *heat, oa*, in *boat*.—**A**, in music, is the sixth note in the diatonic scale of C, and stands when in perfect tune to the latter note in the ratio of $\frac{5}{3}$ to 1. The second string of the violin is tuned to this note.

**A 1.** A symbol attached to vessels of the highest class in Lloyd's register of shipping, A referring to the hull of the vessel, 1 to the rigging and whole equipment. When A 1 has a number prefixed, as 100 A 1, 90 A 1, the number denotes that the vessel is built according to certain specifications. *See* SHIPBUILDING.

**Aa** (ä) (Old Ger. *aha*, water; allied to Lat. *aqua*, water). The name of a great many streams of Central and Northern Europe.

**AACHEN** (ä'*h*ĕn). *See* AIX-LA-CHAPELLE.

**AAL.** Native name for Indian shrubs of the madder family, *morinda citrifolia*, and *morinda tinctoria*. It is also used for the red dye obtained from their roots. A tree of the terebinth family grown in the Molucca Islands is called the aal. It has an aromatic bark which is used in seasoning food.

**AALAND ISLANDS.** *See* ALAND ISLANDS.

**AALBORG** (ōl'bor*h* : " eel-town "). A seaport of Denmark, in Jutland, on the Liimfiord, see of a bishop, with iron-founding, distilling, fishing, etc. Pop. 44,365.

**AALEN** (ä'lĕn). A town of Germany in Württemberg, which manufactures woollen and linen goods. It has important iron-works and tanneries. Pop. 12,180.

**AALESUND** (ō'le-sund). Seaport and fishing centre on the west coast of Norway, on a small island. Pop. 13,373.

**AALI PASHA.** *See* ALI PASHA.

**AALST** (älst). *See* ALOST.

**AAR, or AARE** (ăr). The name of several European rivers, of which the chief (181 miles long) is a tributary of the Rhine, next to it and the Rhone, the longest river in Switzerland. It has its origin from the Upper and Lower Glaciers of the Aar, in the Bernese Alps, traverses Lakes Brienz and Thun, and receives the Saane, Reuss, Limmat, etc. On it are Interlaken, Thun, Bern, Solothurn, and Aarau, to which, as to the canton of Aargau, it gives its name.

**AARAU** (ä'rou). A well-built and finely-situated town in Switzerland, capital of canton Aargau, on the River Aar. Pop. 12,063.

**AARD-VARK** (ärd'vârk : earth-pig). Dutch name for a burrowing insect-eating animal of South Africa, *orycterōpus capensis*, order Edentata, resembling the ant-eater and armadillo. It is called also *ground-hog* and *Cape pig*.

**AARDWOLF** (ärd'wulf : earth-wolf) (*Protēles cristātus*). A burrowing carnivore of S. and E. Africa, allied

Aardwolf

to the hyenas and civets. It feeds on carrion, small mammals, insects, etc.

**AARE.** *See* AAR.

**AARGAU** (är'gou), or **ARGOVIE** (är-go-vē). A northern canton of Switzerland; area, 548 sq. miles; hilly, well wooded, abundantly watered by the Aar and its tributaries, and well cultivated. Pop. 260,199. German is almost universally spoken. Capital, Aarau.

**AARHUUS** (ōr'hös). A seaport and ancient town of Denmark, on the east coast of Jutland. It has a fine Gothic cathedral, a good harbour, and manufactures woollens, gloves, hats, tobacco, etc. Pop. 81,279.

**AARON** (ā'ron). Of the tribe of Levi, brother of Moses. At Sinai, when the people became impatient at the long-continued absence of Moses, he complied with their request by making a golden calf, and thus became involved with them in the guilt of gross idolatry. The office of high-priest, which he first filled, was made hereditary in his family. He died at Mount Hor at the age of 123, and was succeeded by his son Eleazer.

**AARON'S BEARD.** *See* SAINT JOHN'S WORT AND TOAD-FLAX.

**AARON'S ROD.** *See* GOLDEN-ROD and MULLEIN.

**AASVAAR** (ōs'vār). A group of small islands off the Norwegian coast, under the Arctic Circle, where there is an important herring-fishery.

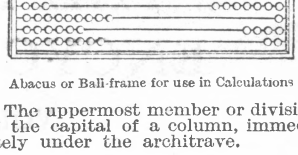
**AB.** The eleventh month of the Jewish civil, the fifth of the ecclesiastical, year—part of July and part of August.

**ABABDA,** or **ABABDEH** (abab'de) (**Gebadei** of Pliny). A nomadic African race inhabiting Upper Egypt and part of Nubia, between the Nile and the Red Sea, dark-brown in colour. Their language is Arabic and they are Mahommedans in religion. They number about 40,000.

**AB'ACA,** or **MANILLA HEMP.** A strong fibre yielded by the leaf-stalks of a kind of plantain (*Musa textilis*) which grows in the Indian Archipelago, and is cultivated in the Philippines. The outer fibres of the leaf-stalks are made into strong and durable ropes, the inner into various fine fabrics.

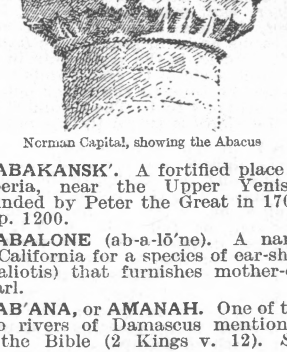
**AB'ACO, Great** and **Little.** Two islands of the Bahamas group. (q.v.). Pop. about 4000.

**AB'ACUS.** A Latin term applied to an apparatus used in elementary schools for facilitating arithmetical operations, consisting of a number of parallel cords or wires, upon which balls or beads are strung, the uppermost wire being appropriated to units, the next to tens, etc.



Abacus or Bali-frame for use in Calculations

The uppermost member or division of the capital of a column, immediately under the architrave.



Norman Capital, showing the Abacus

**ABAKANSK'.** A fortified place in Siberia, near the Upper Yenisei, founded by Peter the Great in 1707. Pop. 1200.

**ABALONE** (ab-a-lō'ne). A name in California for a species of ear-sheil (Haliotis) that furnishes mother-of-pearl.

**AB'ANA,** or **AMANAH.** One of the two rivers of Damascus mentioned in the Bible (2 Kings v. 12). *See* BARADA.

**ABAN'DONMENT.** A term of marine insurance, employed to designate the case where the party insured gives up his whole interest in the property to the insurer, and claims as for a total loss.—BIBLIOGRAPHY: G. G. Phillimore, *Marine Insurance*, in *Encyclopedia of the Laws of England*, vol. viii.; C. R. Tyser, *Law relating to Losses under a Policy of Marine Insurance.*

**AB'ANO.** A village of North Italy, 6 miles by rail from Padua, famous for its mud-baths and warm springs. It is supposed to be the birthplace of Livy.

**ABA'RIM.** A mountain range of Eastern Palestine, including Nebo, on which Moses died.

**ABATEMENT.** In law, has various significations. *Abatement of nuisances* is the remedy allowed to a person injured by a public or private

nuisance, of destroying or removing it himself. A *plea in abatement* is brought forward by a defendant when he wishes to defeat or quash a particular action on some formal or technical ground. Abatement, in mercantile law, is an allowance, deduction, or discount made for prompt payment or other reason.

**AB'ATTIS,** or **ABATIS.** In field engineering, a mass of trees cut down and laid with their branches turned towards the enemy in such a way as to form a defence for troops stationed behind them.

**ABATTOIR** (ab-at-wär'). *See* SLAUGHTER-HOUSE.

**ABBA.** A Syrian word equivalent to "father," which, being applied in the Eastern Church to monks, superiors of monks, and other ecclesiastics, gave rise to the word *abbot*. In the Syriac and Coptic Churches it is given to bishops.

**ABBAS I.** The *Great*, Shah or King of Persia, born in 1557, ascended the throne in 1586, at a time when the Turks and hordes of Usbek Tartars had made great encroachments on the country. Having defeated the Usbeks, recovered the provinces overrun by them, and reduced a great part of Afghanistan, he made war against the Turks, and in 1605 defeated them near Bussorah, thus getting back all the lost provinces. He extended his rule beyond Persia proper, and at his death in 1628 his dominions stretched from the Tigris to the Indus. He is looked upon by the Persians as their greatest sovereign.

**ABBAS II., Hilmi.** Ex-Khedive of Egypt, was born in 1874. He is the eldest son of Tewfik Pasha, and succeeded his father in 1892. During his reign he adopted an unfriendly attitude towards England, but he failed in his attempt to form an anti-British Cabinet in 1893. On 19th Dec., 1914, the British Government issued a proclamation deposing Abbas Hilmi and conferring the title of Sultan of Egypt upon Hussein Kamil, eldest living prince of the family of Mohammed Ali-Hussein Kamil, who died in 1917. *See* EGYPT.

**ABBAS MIRZA.** A Persian prince and soldier, was the son of the shah Feth Ali; born 1783, died 1833; he greatly distinguished himself in the wars against Russia.

**ABBASIDS,** or **ABBASSIDES** (ab'as-sidz). The name of the second Arabian dynasty which supplanted the Ommiades. It traced its descent from Abbas (born 566, died 652), uncle of Mahomet, and gave thirty-seven caliphs to Bagdad between 749 and 1258. Harun al Rashid was a member of this dynasty. *See* CALIPHS.

**ABBATE** (ab-bā'tā). The Italian term corresponding to *Abbé*.

**ABBÉ** (ab-ā). A French word for abbot, or for anyone regularly wearing the clerical dress. Before the Revolution, all who had studied theology, either with the view of becoming ordained clergymen or merely of obtaining some ecclesiastical appointment or benefice, were generally so designated. Marked out by their special dress, a short, violet-coloured robe, they were seen everywhere—at court, the ball, the theatre, and in private families, where they acted sometimes as tutors and sometimes as confidential advisers. Others, again, adopted the literary profession or became teachers in the higher educational establishments.

**ABBE, Cleveland.** American meteorologist and astronomer, born at New York in 1838, and educated at Harvard. He held various positions in connection with observatories and other institutions in America, and was for some time chief meteorologist in the United States Weather Bureau. He wrote much on meteorology and kindred subjects. He died in 1916. His works include: *The Mechanics of the Earth's Atmosphere*; *Relations between Climates and Crops*, etc.

**ABBEOKU'TA.** A town of West Africa, in the Lagos Province of S. Nigeria, on the Ogun River, and on the railway from Lagos to N. Nigeria, 60 miles north of Lagos, consists chiefly of mud houses, surrounded by a mud wall. Pop. 38,000.

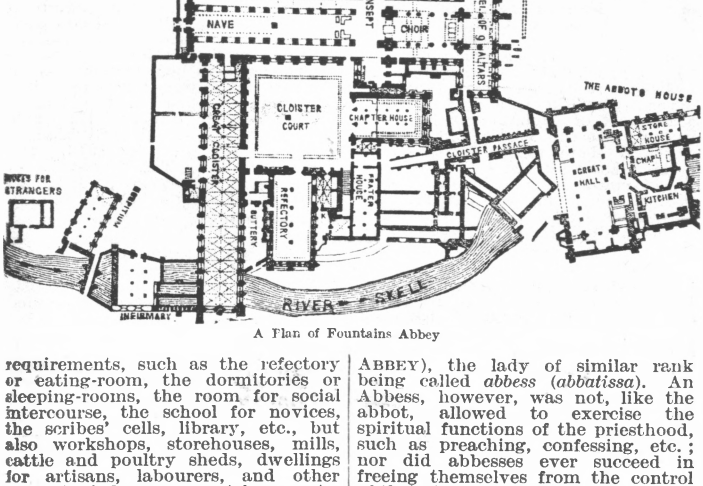
**AB'BESS.** *See* ABBEY and ABBOT.

**ABBEVILLE** (ancient **ABBATIS VILLA**). A town of France, department of the Somme, on the River Somme (which is here tidal), 108 miles N.N.W. of Paris. The town is first mentioned in the ninth century, when it belonged to the Abbey of St. Riquier. It has a Gothic church (St. Vulfran, begun in the fifteenth century and completed in the seventeenth), which has a magnificent west front in the Flamboyant style. It manufactures woollens, sail-cloth, chemicals, etc. Pop. 21,472.

**AB'BEY.** A monastery or religious community of the highest class, governed by an *abbot*, assisted generally by a prior, sub-prior, and other subordinate functionaries; or, in the case of a female community, superintended by an *abbess*. An abbey invariably included a

church. A priory differed from an abbey only in being scarcely so extensive an establishment, and was governed by a *prior*. In the English conventual cathedral establishments, as Canterbury, Norwich, Ely, etc., the archbishops or bishops held the abbot's place, the immediate governor of the monastery being called a prior. Some priories sprang originally from the more important abbeys, and remained under the jurisdiction of the abbots; but subsequently any real distinction between abbeys and priories was lost.

The greater abbeys formed most complete and extensive establishments, including not only the church and other buildings devoted to the monastic life and its daily requirements, such as the refectory or eating-room, the dormitories or sleeping-rooms, the room for social intercourse, the school for novices, the scribes' cells, library, etc., but also workshops, storehouses, mills, cattle and poultry sheds, dwellings for artisans, labourers, and other servants, infirmary, guest-house, etc.




A Plan of Fountains Abbey

Among the most famous abbeys on the continent of Europe were those of Cluny, Clairvaux, and Citeaux in France; St. Galle in Switzerland, and Fulda in Germany; the most noteworthy English abbeys were those of Westminster, St. Mary's of York, Fountains, Kirkstall, Tintern, Rievaulx, Netley; and of Scotland, Melrose, Paisley, and Arbroath.

**ABBEY, Edwin Austin.** American artist. Born in Philadelphia, April 8, 1852, he studied art, and drew for *Harper's Magazine* and other periodicals. In 1881 he came to England. His paintings soon found recognition, and he was elected A.R.A. in 1896, and R.A. in 1898. He died in Chelsea, Aug. 1, 1911. Abbey's work includes a series on the history of Pennsylvania in the Capitol at Philadelphia, a series at Boston, the official picture of the coronation of Edward VII., and "May Morning." In 1931 his house in Chelsea was bequeathed by his widow to the Royal Academy.

**ABBIATEGRASSO** (ȧb-bē-ä'tā-grȧs-sō). A town in the north of Italy, 15 miles W.S.W. of Milan. Pop. 13,148.

**AB'BOT** (from the Syriac *abba*, father). The head of an abbey (*see* ABBEY), the lady of similar rank being called *abbess* (*abbatissa*). An Abbess, however, was not, like the abbot, allowed to exercise the spiritual functions of the priesthood, such as preaching, confessing, etc.; nor did abbesses ever succeed in freeing themselves from the control of their diocesan bishop. In the early age of monastic institutions (*circ.* A.D. 300-600) the monks were not priests, but simply laymen who retired from the world to live in common, and the abbot was also a layman. In the course of time the abbots were usually ordained, and when an abbey was directly attached to a cathedral the bishop was also the abbot, but the functions devolving on the head of a monastery were, in this case, performed by a prior.

At first the abbeys were more remarkable for their numbers than for their magnitude, but afterwards many of them were large and richly endowed, and the heads of such establishments became personages of no small influence and power, more especially after the abbots succeeded (by the eleventh century) in freeing themselves from the jurisdiction of the bishop of their diocese. Hence families of the highest rank might be seen eagerly striving to obtain the titles of abbot and abbess for their members. The great object was to obtain control over the revenues of the abbeys, and for this purpose recourse was had to the device of holding them under a kind of trust, or, as it was called, *in commendam*. According to the original idea, the abbot *in commendam*, or "commendator," was merely a temporary trustee, who drew the whole or part of the revenues during a vacancy, and was bound to apply them to specific purposes; but ultimately the commendator or lay abbot in many instances held the appointment for life, and was allowed to apply the whole or a large portion of the revenues to his own private use. Many of the abbots vied with the bishops and nobility in rank and dignity. In England abbots long sat in the House of Lords, ranking next after barons. Seventeen of them were present on 28th June, 1539, the last occasion when the abbots as a body sat in Parliament.

The Reformation introduced vast changes, not only in Protestant countries, where abbeys and all other monastic establishments were generally suppressed, but even in countries which still continued Roman Catholic; many sovereigns, whilst displaying their zeal for the Roman Catholic Church by persecuting its opponents, did not scruple to imitate them in the confiscation of Church property.

**ABBOT** (or Lord) **OF MISRULE.** The personage who took the chief part in the Christmas revelries of the English populace before the Reformation. In Scotland he was called Abbot of Unreason.

**ABBOT, George.** Archbishop of Canterbury, was born in 1562 and died in 1633. He studied at Oxford, assisted in the translation of the Bible, was made Bishop of Lichfield in 1609, next year Bishop of London, and in 1611 Archbishop of Canterbury. He retained the favour of James I. to the last, but after the accession of Charles I. his influence at Court was superseded by that of Laud. He published several works, chiefly theological, and *A Brief Description of the Whole World* (1599).

**ABBOT'S BROMLEY.** Village of Staffordshire, 12 miles from Stafford and 129 from London. It is famous because a mediæval performance called the Horn Dance takes place here at the fair in July, and at the Wakes on a Monday in September.

**ABBOTSBURY.** Market town of Dorset, 7 miles from Dorchester, on the G.W.Rly. There are ruins of an abbey. Here is Abbotsbury House, a seat of the earl of Ilchester, famous for its swannery and its sub-tropical gardens. Pop. 627.

**AB'BOTSFORD.** The country-seat of Sir Walter Scott, on the south bank of the Tweed, in Roxburghshire, 3 miles from Melrose, in the midst of picturesque scenery, forming an extensive and irregular pile in the Scottish baronial style of architecture.

**Abbotsford Club,** a club established at Edinburgh for printing works throwing light on matters of history or literature connected with the writings of Sir Walter Scott; issued 34 vols. 1835-64.

**AB'BOTT, Rev. Edwin, D.D.** Prolific writer on theological, educational, and other subjects, born in London, 1838, was educated at the City of London School and St. John's College, Cambridge, where he highly distinguished himself; he was head master of the City of London School from 1865 to 1889, when he retired. His *Shakespearian Grammar* (1870) is one of his best contributions to English philology. Among his theological and kindred writings are: *Through Nature to Christ*; *Bible Lessons*; *Cambridge Sermons*; *Oxford Sermons*; the elaborate article *Gospels* in the *Encyclopædia Britannica* (9th edition); *From Letter to Spirit.* Other works are: *Philochristus* and *Onesimus*, both romances on the history of the Early Christian Church; *Francis Bacon, an Account of his Life and Works*; *St. Thomas of Canterbury, his Death and Miracles*; *The Anglican career of Cardinal Newman* (a very depreciatory estimate); *Flatland, a Romance of Many Dimensions.* He also wrote: *Johannine Grammar* (1906), *The Message of the Son of Man* (1909), *The Fourfold Gospel* (1913-7). He died in 1926.

**AB'BOTT, Jacob.** A popular American writer, especially of entertaining and instructive books for the young. He was born in 1803 and died in 1879. For a time he was a teacher and later a clergyman.

**AB'BOTT, Thomas Kingsmill, D.D.** Biblical scholar and writer on philosophic and other subjects, born at Dublin, 1829, died 18th Dec., 1913. He studied with distinction at Trinity College, and was successively professor in Dublin University of moral philosophy, 1867-72; of Biblical Greek, 1875-88; and of Hebrew, 1879-1900; he was at one time librarian of the College. He has written *Sight and Touch*, directed against the Berkeleian theory of vision; *Elements of Logic*; *Essays, chiefly on the Original Texts of the Old and New Testaments*; *Notes on some Epistles of St. Paul*; *Elementary Theory of the Tides*; *Translation of Kant's Theory of Ethics*; *Kant's Introduction to Logic*; *Commentary on Ephesians and Colossians*; etc.

**ABD-EL-KA'DER.** An Arab chief, born in Algeria, 1807; died at Damascus, 1883. He was the chief opponent of the French in their conquest of Algeria, but at last surrendered to them in 1847, and was imprisoned till set at liberty by Napoleon III. in 1852. He afterwards resided chiefly at Damascus, but made various journeys, and visited the Paris exhibition of 1867. He wrote a religious philosophical work in Arabic, which has been translated into French.

**ABDE'RA.** An ancient Greek city on the Thracian coast, the birthplace of Democritus (the laughing philosopher), Anaxarchus, and Protagoras. Its inhabitants were proverbial for stupidity.

**ABDICA'TION.** Properly the voluntary, but sometimes also the involuntary, resignation of an office or dignity, and more especially that of sovereign power. Abdication does not necessarily require the execution of a formal deed, but may be presumed from facts and circumstances, as in the case of the English Revolution in 1688, when, after long debate, it was resolved by both Houses of Parliament that King James II., having endeavoured to subvert the constitution of the kingdom, had "*abdicated* the government, and that the throne is thereby vacant." Yet the sovereign of Great Britain cannot constitutionally abdicate without the consent of both Houses of Parliament. The principal abdications in recent years were: Tsar Nicholas II. of Russia, 14th March, 1917; King Constantine of Greece, 11th June, 1917; King Ferdinand of Bulgaria, 6th Oct., 1918; Wilhelm II. of Germany, 9th Nov., 1918; Karl I. of Austria, 13th Nov., 1918; and Marie Adelaide, Grand-Duchess of Luxembourg, 15th Jan., 1919. Alphonso XIII. of Spain was forced to leave his country in 1930 but he refused to abdicate. In 1932 his property was confiscated by the Spanish Republic.

**ABDO'MEN.** In man, the belly, or lower cavity of the trunk, separated from the upper cavity or thorax by the diaphragm or midriff, and bounded below by the bones of the pelvis. It contains the viscera belonging to the digestive and urinary systems. What are called the *abdominal regions* will be understood from the accompanying drawing, in which 1 is the *epigastric* region, 2 the *umbilical*, 3 the *pubic*, 4 4 the right and left *hypochondriac*, 5 5 the right and left *lumbar*, 6 6 right and left *iliac*. The name is given to the corresponding portion of the body in other animals. In insects it comprises the whole body behind the thorax, usually consisting of a series of rings. *See* ALIMENTARY CANAL.

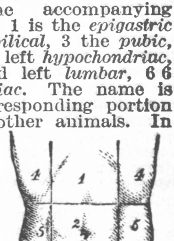


Diagram of the Abdominal Regions

**ABDOM'INAL FISHES** (Abdominales). A group of the soft-finned (or malacopterous) fishes, having fins upon the abdomen, and comprising the herring, pike, salmon, carp, etc.

**ABDUC'TION.** A legal term, generally applied to denote the offence of carrying off a female either forcibly or by fraudulent representations. Such a delinquency in regard to a man is styled *kidnapping*. There are various descriptions of abduction recognised in criminal jurisprudence, such as that of a child, of an heiress, or of a wife. In Great Britain the punishment is penal servitude for not more than seven years, but the sentence can be more severe if the person abducted is the owner of property or the heiress to property. Special penalties are inflicted upon those who abduct girls under eighteen.

**AB'DUL AZ'IZ.** Sultan of Turkey, was born in Feb., 1830, and succeeded his brother Abdul-Mejid, in June, 1861. He concluded treaties of commerce with France and England, both of which countries he visited in 1867. Deposed in May, 1876, he committed suicide, or more probably was assassinated in June of the same year. He was succeeded by his son Murad V. *See* next article.

**AB'DUL-HAM'ID.** Sultan of Turkey, younger son of Abdul-Mejid, born 22nd Sept., 1842, succeeded his brother Murad V., who was deposed on proof of his insanity in 1876. At that time Turkey, which was at war with Serbia, was compelled to agree to an armistice at the demand of Russia. The persecution and oppression of the Christian population of Bulgaria had roused remonstrances from other European countries, and a congress met at Constantinople to consider a constitution which the Porte had proclaimed. The conference was a failure, and in April, 1877, war was declared by Russia. During the sanguinary struggle which ensued the Turks fought with great bravery, but they had ultimately to sue for peace. A treaty was signed at San Stefano in Feb., 1878, but its provisions were modified by a congress of the Great Powers which met at Berlin. The island of Cyprus was ceded to Britain. Serbia, Romania, and Montenegro were freed from Turkish suzerainty altogether; Bulgaria was left in nominal dependence; whilst Bosnia and Herzegovina were placed under Austrian administration. In 1881 Thessaly was transferred to Greece; in 1885 E. Roumelia became united to Bulgaria. Ever since the Treaty of Berlin, Abdul Hamid saw in Germany the future friend of Turkey. He therefore entrusted Germans with the reorganisation of his army and finances. Subsequently there were massacres of Christians, a war with Greece (1897), and troubles in Crete and Macedonia. In April, 1909, the Sultan was deposed, and his brother, Rashid Effendi, proclaimed sultan as Mohammed V. Abdul Hamid died in captivity, 10th Feb., 1918.

**ABD-UL-LAT'IF.** An Arab writer and physician, was born at Bagdad in 1161 and died there in 1231. He was patronised by the celebrated Saladin, and published an excellent description of Egypt, which is still extant. It was translated into English by White, Oxford, 1800.

**AB'DUL-MEJ'ID KHAN.** Sultan of Turkey, born in 1823, succeeded his father, Mahmud II., 1st July, 1839. At the time of his accession, Mehemet, Pasha of Egypt, had risen a second time against the Turkish yoke; his son Ibrahim had inflicted a severe defeat on the Turks at Nizib (24th June, 1839), and was advancing on Constantinople. But the intervention of the leading European Powers checked the designs of Mehemet Ali, and saved the Turkish empire. Abdul-Mejid was desirous of carrying out reforms, but most of them were not enforced, or caused bloody insurrections where attempts were made to carry them out. Owing to disputes between the Latin and Greek Churches regarding the rights of precedence and possession of the "holy places" in Palestine, and to demands made by the Tsar virtually implying the right of protectorate over the Christian subjects of the Sultan, war broke out between Turkey and Russia in 1853. In the following year the Porte effected an alliance with France and England (hence the Crimean War), and later on with Sardinia. (*See* CRIMEAN WAR). Abdul-Mejid died 25th June, 1861, and was succeeded by his brother, Abdul-Aziz.

**ABECEDA'RIAN.** A term formed from the first four letters of the alphabet, and applied to the followers of Storch, a German Anabaptist (1522), because they rejected all worldly knowledge, even the learning of the alphabet.

**A BECKET, Thomas.** *See* BECKET.

**A BECK'ETT, Gilbert Abbott.** English writer, born near London in 1811. He studied for the bar, and became one of the original staff of *Punch*, was long a leader-writer to the *Times* and the *Morning Herald*, and contributed articles to the *Illustrated London News*. He wrote *Comic History of England*, *Comic History of Rome*, and *Comic Blackstone*, and between fifty and sixty plays. In 1849 he was appointed a metropolitan police magistrate, which office he retained till his death in 1856.

**ABEL,** properly **HEBEL** (Heb. breath, vapour, vanity). The second son of Adam. He was a shepherd, and was slain by his brother Cain from jealousy because his sacrifice was accepted while Cain's was rejected. Several of the fathers, among others St. Chrysostom and Augustine, regard him as a type of the new, regenerate man.

**ABEL, Sir Frederick Augustus.** Chemist, was born in London, 1827; died 1902. Having adopted chemistry as a profession, he studied under Hofmann at the Royal College of Chemistry, became professor of chemistry at the Royal Military Academy in 1851, and was chemist to the War Department and chemical adviser to the Government from 1854 to 1888. He did useful work in connection with the chemistry of explosives (especially gun-cotton), the flashpoint of petroleum, etc.; was joint-inventor of cordite along with Dewar; and was also an authority on the manufacture of

steel. He was honoured with a baronetcy, and was also a K.C.B. and a K.C.V.O. He wrote works on gunpowder, gun-cotton, and explosives generally, and on electricity as applied to explosive purposes. His works include : *The Modern History of Gunpowder* ; *Electricity applied to Explosive Purposes*, etc.

**ABÉLARD** (ab'e-lärd), or **ABAILARD, Peter.** A celebrated scholastic teacher, born near Nantes, in Brittany, in 1079. He made extraordinary progress with his studies, and, ultimately eclipsing his teachers, he opened a school of scholastic philosophy near Paris, which attracted crowds of students from the neighbouring city. His success in the fiery debates which were then the fashion in the schools made him many enemies, among whom was Guillaume de Champeaux, his former teacher, chief of the cathedral school of Notre-Dame, and the most advanced of the Realists.

Abélard succeeded his adversary in this school (in 1113), and under him were trained many men who afterwards rose to eminence, among them being the future Pope Celestin II., Peter Lombard, and Arnold of Brescia. While he was at the height of his popularity, and in his fortieth year, he fell violently in love with Heloise—then eighteen years of age —niece of Fulbert, a canon of Paris.

They obtained a home in Fulbert's house under the pretext of teaching Heloise philosophy, and their intercourse at length became apparent, Abélard, who had retired to Brittany, was followed by Heloise, who there gave birth to a son, named Astrolabius. A private marriage took place, and Heloise returned to her uncle's house, but, refusing to make public her marriage (as likely to spoil Abélard's career), she was subjected to severe treatment at the hands of her uncle.

To save her from this Abélard carried her off and placed her in a convent at Argenteuil, a proceeding which so incensed Fulbert that he hired ruffians who broke into Abélard's chamber and subjected him to a shameful mutilation. Abélard, filled with grief and shame, became a monk in the abbey of St. Denis, and Heloise took the veil.

When time had somewhat moderated his grief, he resumed his lectures ; but trouble after trouble overtook him. His theological writings were condemned by the Council of Soissons, and he retired to an oratory called the Paraclete, subsequently becoming head of the abbey of St. Gildas-de-Rhuys in Brittany.

For a short time he again lectured at Paris (1136), but his doctrines once more brought persecution on him, and St. Bernard of Clairvaux, the most powerful man in the Church in those days, had him condemned by the Council of Sens and afterwards by the Pope. Abélard did not long survive this, dying at St. Marcel, near Chalon-sur-Saône, 21st April, 1142.

Heloise, who had become abbess of the Paraclete, had him buried there, where she herself was afterwards laid by his side. Their ashes were removed to Paris in 1800, and in 1817 they were finally deposited beneath a mausoleum in the cemetery of Père la Chaise. According to John of Salisbury, Abélard is credited with the invention of a new philosophical system, midway between Realism and Nominalism.

In Ethics, Abélard seems to have attached importance to the psychological element in the action, rather than to the action itself. "The intention of sinning," he maintained, "is worse than the actual physical sin." A complete edition of his works was published by Cousin (2 vols., Paris, 1849-59), and the letters of Abélard and Heloise have been often published in the original and in translations. Pope's *Eloisa to Abélard* is founded on them. Abélard's autobiography, entitled *Story of my Calamities*, is still extant.—BIBLIOGRAPHY : Charles de Rémusat, *Abélard* (2 vols.) ; J. M'Cabe, *Life of Abélard*.

**ABELE** (a-bēl'). A name of the white poplar.

**A'BELITE,** or **ABE'LIAN.** A member of a religious sect in Africa which arose in the fourth century after Christ. They married, but lived in continence, after the manner, as they maintained, of Abel, and attempted to keep up the sect by adopting the children of others.

**ABELMOSCHUS** (-mos'kus). A genus of tropical plants of the mallow family. *A. esculentus*, cultivated in India, Algeria, etc., yields edible pods and also a valuable fibre. The fruit, called *okro* or *ochro*, is used in soups.

**AB'EN EZRA** (Ibn Ezra). A celebrated Jewish rabbi, born at Toledo about 1093, travelled in pursuit of knowledge in England, France, Italy, and Greece, and is supposed to have died in Rhodes about 1167. He is best known as a commentator on Scripture.

**ABENSBERG** (ä'bens-berh). A village of Bavaria, in the Danube valley, below Ingolstadt, celebrated

victory over the April, 1809.

*See* ABEOKUTA.

prefix in Celtic geogra- names signifying the mouth or entrance of a river into the sea, or into another stream. It is used chiefly in Wales and Scotland, having the same meaning as *inver*.

**ABERA'VON.** A former municipal borough of Wales in Glamorganshire, near the mouth of the Avon in Swansea Bay. In 1921 it was merged into the municipal borough of Port Talbot (q.v.). There are collieries, ironworks, copper-works, etc. Since 1918 Aberavon has given its name to a parliamentary division of the county of Glamorgan.

**ABERBROTH'OCK.** *See* ARBROATH.

**ABERCARN'.** An urban district or town of England, Monmouthshire, 10¾ miles north-west of Newport, with collieries, ironworks, etc. Pop. (1931), 20,554.

**AB'ERCROMBIE, John, M.D.** A Scottish writer on medical and moral science, and an eminent physician, born in Aberdeen, 1781, died at Edinburgh in 1844. He graduated at the university of Edinburgh in 1803, and subsequently pursued his studies in London, returning to Edinburgh in 1804, where he acquired an extensive practice as a physician. Apart from medical treatises, he is known from his *Inquiries concerning the Intellectual Powers* and his *Philosophy of the Moral Feelings*.

**AB'ERCROMBIE, Patrick.** A Scottish historical writer and antiquary, born at Forfar, 1656; date of death uncertain. Educated at St. Andrews and abroad, he took the degree of M.D., and practised as a physician in Edinburgh. In 1685 he was appointed physician to James II. His chief work is *Martial Atchievements of the Scots Nation*, 2 vols. folio, 1711-6.

**AB'ERCROMBY, Sir Ralph.** A British general, born in 1734 in Clackmannanshire, Scotland. He entered the army in 1756 as coronet in the 3rd Dragoon Guards; and he gradually passed through all the ranks of the service until he became a major-general in 1787. He served as lieutenant-general in Flanders, 1793-5, and was then appointed commander-in-chief of the forces in the West Indies, where he captured the islands of Grenada, St. Lucia, St. Vincent, and Trinidad, with the settlements of Demerara and Essequibo. On his return in 1798 he was appointed commander-in-chief in Ireland; and he afterwards held a corresponding command in Scotland. His next and concluding service was in the expedition to Egypt, of which he was commander-in-chief. He landed, after a severe fight, at Aboukir, 8th March, 1801; and on the 21st of the same month the battle of Alexandria was fought, in which Sir Ralph was mortally wounded.

**ABERDARE** (-dăr'). A town of South Wales, in Glamorganshire, pleasantly situated at the junction of the Cynon and Dare, 4 miles south-west of Merthyr-Tydfil, with extensive coal and iron mines in the vicinity. It belongs to the parliamentary borough of Merthyr-Tydfil. Pop. (1931), 48,751.

**ABERDEEN'.** A university city and royal, municipal, and parliamentary burgh of Scotland, capital of the county of same name, mainly on the north bank of the Dee at its entrance into the North Sea, and between this river and the Don, with a part also on the south bank of the Dee, while the municipal limits include the adjacent Woodside. The site is in places somewhat hilly. Aberdeen is one of the oldest towns in Scotland, and was constituted a royal burgh by William the Lion in 1179.

The streets are generally spacious and regular, the houses built of fine grayish-white granite. There are many handsome public buildings, as the County and Municipal Buildings, Marischal College, Grammar School, Infirmary, Arts School, Art Gallery, Music Hall Buildings, public library, etc. The finest street, Union Street, made in 1800, is carried over a valley by a granite bridge having an arch of 132 feet span. The small portion of the city called Old Aberdeen, long a separate town, consists mainly of a single street, stretching northwards to the River Don. Its chief buildings are King's College and St. Machar's Cathedral. Noteworthy features of the college buildings are the crown-tower and the chapel, the latter containing some very fine old carved woodwork. The cathedral, now used as a parish church, was commenced about 1357.

There are several bridges over the Dee and Don. Over the latter is a fine old bridge (Brig o' Balgownie) of one arch, erected according to some accounts by Robert Bruce. There are docks 34 acres in area, an extensive tidal harbour and basin, and a graving-dock. The shipping trade is extensive. The industries embrace wool, jute, linen, combs, soap, preserved provisions, chemicals,

paper, shipbuilding, engineering, and especially the cutting and polishing of granite. The fishing industry is of great importance. The city returns two members to Parliament. Pop. (1931), 167,259.

**The County of Aberdeen** forms the north-eastern portion of Scotland, and is bounded on the east and north by the North Sea. Area, 1,262,080 acres. It is divided into six districts (Mar, Formartine, Buchan, Alford, Garioch, and Strathbogie), and is generally hilly, there being in the south-west some of the highest mountains in Scotland, as Ben Macdhui (4236 feet), Cairntoul (4241), Cairngorm (4084), Lochnagar, etc. Its most valuable mineral is granite, large quantities of which are exported. The principal rivers are the Dee and the Don, both of which enter the sea at the town of Aberdeen. Cereals (except wheat) and other crops succeed well, and the number of acres under cultivation is nearly double that of any other Scottish county. Great numbers of cattle are fattened and sent to London and the south. On the banks of the upper Dee is situated Balmoral, a favourite residence of Queen Victoria. Aberdeenshire and Kincardine unite in sending three members to Parliament. Pop. (1931), 300,430.

**Aberdeen University**, as now constituted, derives its origin from two different foundations; one, the University and King's College (Old Aberdeen), founded in 1494 by Bishop Elphinstone (who was bishop of Aberdeen from 1483-1514) under the authority of a papal bull obtained at the instance of James IV.; the other, Marischal College and University (New Aberdeen), founded in 1593 by Geo. Keith, Earl Marischal, by a charter ratified by act of Parliament.

The two foundations existed as separate universities, both having the right of conferring degrees, till 1860, when they were united and incorporated into one university, the University of Aberdeen. Holding the funds of both colleges and dating as from the foundation of King's College in 1494, the university has about 300 bursaries or exhibitions, mostly open to public competition, and a number of money prizes and scolarships. The classes for arts and divinity are held in King's College, and those for law and medicine in Marischal College. There is a full teaching staff in the faculties of arts, medicine, science, and divinity, and two professors in that of law.

There are in all 25 professors and some 900 matriculated students. The constitution of the university is similar to that of Edinburgh and the other Scottish universities. The library contains over 80,000 volumes. The university unites with those of Edinburgh, Glasgow, and St. Andrews in sending three members to Parliament.

**ABERDEEN', Earl of.** Scottish title borne by the family of Gordon. The first earl, George Gordon, was a lawyer and a baronet. In 1682 he was made Lord Chancellor of Scotland and Earl of Aberdeen, and he died April 20, 1720. His descendant, George Hamilton Gordon, became the 4th earl in 1801 (see below).

His grandson, John Campbell Gordon, became the 7th earl in 1870, and in 1915 was made Marquess of Aberdeen and Temair. He was Lord Lieutenant of Ireland in 1886 and from 1905-15, Governor-General of Canada, 1893-98. With his wife, a daughter of the 1st Baron Tweedmouth, he wrote *We Twa*, a book of memories, and a further volume, *More Cracks with We Twa*. The marquess owns much land in Aberdeenshire. His seat there is Haddo House, and his eldest son is called Lord Haddo.

**ABERDEEN', George Hamilton Gordon, Earl of.** British statesman, born 28th Jan., 1784, died 14th Dec., 1860. He began his diplomatic life in 1801 as attaché to Lord Cornwallis's embassy to France, which resulted in the signing of the treaty of Amiens. In 1806 he entered Parliament as a Scottish representative peer, and in 1813 was entrusted with a successful mission to Austria for the purpose of inducing the emperor to join the coalition of sovereigns against Bonaparte. In 1814 he was created a British peer, and in 1828 he became Foreign Secretary in the Duke of Wellington's administration. During the short premiership of Sir Robert Peel in 1834-5 he acted as Colonial Secretary, and when Sir Robert again became premier in 1841 he took office as Secretary for Foreign Affairs. He was a warm supporter of Catholic Emancipation, and endeavoured, though without result, to bring in a compromise bill in 1846, during the struggle which divided the Established Church of Scotland. Quitting office with his chief in 1846, he came, on the death of Peel in 1850, to be regarded as the leader of the Conservative free-trade party. On the Derby ministry failing to maintain its place, Lord Aberdeen returned to office in the end of 1852 as head of a coalition ministry. The principal event which marked his administration was the Crimean war: but

the bad management of this irritated the country, and the ministry resigned in 1855. This event marks the close of Lord Aberdeen's public career. From his travels and his acquaintance with Greece and its antiquities he was called by Byron "the travelled thane, Athenian Aberdeen."

**AB'ERDEVINE.** *See* SISKIN.

**ABERDOUR'.** Pleasure resort of Fifeshire. It stands on the Firth of Forth, 18 m. from Edinburgh, on the L.N.E. Rly. Near are the ruins of a castle, where the Earls of Morton lived. Pop. 2055.

**ABERDOVEY** (-dŏv'i). Pleasure resort, in Merionetshire. It is 4 miles from Towyn on the G.W. Rly., just where the River Dovey flows into the sea. Pop. 1253.

**ABERFELD'Y.** Burgh and market town of Perthshire. It stands on the Tay, 30¾ miles from Perth and 73 from Edinburgh, and is reached by the L.M.S. Rly. The scenery around, referred to by Burns in *The Birks of Aberfeldy*, is very beautiful, the Falls of Moness being a great attraction. Pop. (1931), 1505.

**ABERFOYLE'.** Village of Perthshire. It stands on the Laggan, 26 miles from Glasgow, and 55¼ from Edinburgh on the L.N.E. Rly. In the midst of beautiful scenery, it is the scene of incidents mentioned in *Rob Roy*. There is the inn where Rob Roy met Bailie Nicol Jarvie, while the ruins of Jean MacAlpine's Inn are just outside the village. Pop. 1014.

**ABERGAVEN'NY** (sometimes pron. ab-ĕr-ge'ni, the Roman **Gobannium**). A municipal borough and market town of England, in Monmouthshire, situated amid delightful scenery in the beautiful valley of the Usk. It manufactures woollens and shoes, and has considerable trade. Pop. (1931), 8608.

**ABERGELE.** Watering place and market town of Denbighshire, 11½ miles from Llandudno and 212¼ from London, on the L.M.S. Rly. Pop. (1931), 2651.

**ABERGLAS'LYN.** Pass in Wales. It is near Beddgellert, on the borders of Carnarvonshire and Merionethshire, and is made by the little River Glaslyn flowing between steep rocks.

**ABERNETHY** (ab-ĕr-neth'i), **John.** An eminent English surgeon, of somewhat eccentric habits, born in 1764 in London, a pupil of the celebrated John Hunter. In 1787 he became assistant surgeon at St. Bartholomew's Hospital, and shortly after lecturer on anatomy and surgery. In 1815 he was elected principal surgeon, and under his auspices the hospital attained a celebrity which it had never before enjoyed. He published *Surgical Observations*; *The Constitutional Origin and Treatment of Local Diseases*; and *Lectures*, explanatory of Hunter's opinions of the vital processes; besides smaller essays. He died in 1831.

**ABERRA'TION.** In astronomy, the difference between the true and the observed position of a heavenly body, the result of the combined effect of the motion of light and the motion of the eye of the observer caused by the annual or diurnal motion of the earth; or of the motion of light and that of the body from which the light proceeds. When the auxiliary cause is the annual revolution of the earth round the sun it is called *annual aberration*, in consequence of which a fixed star may appear as much as 20·4″ from its true position; when the auxiliary cause is the diurnal rotation of the earth on its axis it is called *diurnal aberration*, which amounts at the greatest to 0·3″; and when the auxiliary cause is the motion of the body from which the light proceeds it is called *planetary aberration*.

**ABERSYCHAN** (ab-ĕr-sik'an). A town of Monmouthshire, England, about 10 miles north of Newport on the G.W. Rly., in a rich coal-mining district. Pop. (1931), 25,627.

**ABERTIL'LERY.** An urban district or town of England, Monmouthshire, 16 miles north-west of Newport, with tinplate works, coalmines, etc. Since 1918 it gives its name to a parliamentary division of the county. Pop. (1931), 31,799.

**ABERYSTWITH** (ab-ĕr-ist'with). A seaport and fashionable watering-place of Wales, county of Cardigan, on Cardigan Bay. The town is well built, and the surrounding country is picturesque. There is here a University College of the University of Wales, occupying a handsome Gothic building. Pop. (1931), 9474.

**ABGAR.** Title of the Syrian rulers at Edessa. The fourteenth prince of the dynasty, a contemporary of the Roman emperor Tiberius (A.D. 14-37), is said to have written a letter to our Saviour.

**ABHOR'RERS.** In English history a name given to the Court party in 1679-80, who, on petitions being presented to Charles II. praying him to summon Parliament, signed counter-petitions expressing *abhorrence* for those who were thus attempting to encroach on the royal prerogative.

**A'BIB.** The first month of the Jewish ecclesiastical year, and the seventh of the civil year, corresponding to the latter part of March and the first of April. Also called *Nisan.*

**ABIES** (ab'i-es). A genus of trees. *See* FIR and SPRUCE.

**AB'INGDON.** A municipal borough of England, in Berkshire, 5¼ miles north-west of London, on the right bank of the Thames. It was an important place in Anglo-Saxon times, and Offa, King of Mercia, had a palace in it. Formerly a parliamentary borough, it now gives name to a parliamentary division of Berks. Pop. (1931), 7240.

**AB'INGTON, Frances.** English actress. Born in 1731, Frances Barton, as she was until her marriage, sold flowers and sang in the streets before appearing on the stage. In 1755 she appeared at the Haymarket Theatre, London, and after a few years was invited by Garrick to join him at Drury Lane. There, and later at Covent Garden, she was for over 20 years the leading actress. She played Lady Teazle when *The School for Scandal* first appeared, and her portrait was painted by Reynolds. She died in 1815.

**ABIOGENESIS** (a-bī-o-jen'e-sis). The doctrine or hypothesis that living matter may be produced from non-living; spontaneous generation. *See* GENERATION (SPONTANEOUS).

**ABJURA'TION, Oath of.** An oath which by an English Act passed in 1701 had to be taken by all holders of public offices, clergymen, teachers, members of the universities, and lawyers, abjuring and renouncing the exiled Stuarts: superseded in 1858 by a more comprehensive oath, declaring allegiance to the present royal family.

**Abjuration of the realm** was an oath that a person guilty of felony, who had taken sanctuary, might take. This oath permitted him to go into exile, and not return on pain of death, unless by the king's permission. In ecclesiastical language the term is applied to renunciation of heresy.

**ABKHA'SIA.** A Russian district, at the western extremity and south of the Caucasus, between the mountains and the Black Sea. The Abkhasians form a race distinguished from their neighbours in various respects. At one time they were Christians, but afterwards adopted Mahommedanism. Many of them migrated into Turkish territory in 1864 and 1878.

**ABLAINCOURT.** *See* EUROPEAN WAR.

**AB'LATIVE.** A term applied to a case of nouns, adjectives, and pronouns in Latin, Sanskrit, and some other languages; originally given to the case in Latin because separation from (*ab*, from *latus*, taken) was considered to be one of the chief ideas expressed by the case.

**ABNAKI.** A Confederacy of Algonquin tribes, formerly occupying what is now Maine and Southern New Brunswick. Their territory, to which they removed after 1724, is in Canada on the St. John River and at St. Francis.

**AB'NEY PARK.** District of London. It is famous for its cemetery which was opened in 1840. It is in the borough of Stoke Newington and is named after Sir Thomas Abney.

**ÅBO** (ō'bō). A town and port in Finland, the see of an archbishop, and the capital of Finland till 1819, when it was supplanted by Helsingfors. Pop. 66,200.

**ABOLITIONISTS.** *See* SLAVERY.

**ABOMA'SUM,** or **ABOMA'SUS.** The fourth stomach of ruminating animals, next the *omasum* or third stomach.

**ABO'MEY,** or **AGBO'MEY.** The capital of the French territory and former kingdon of Dahomey, in West Africa, in a fertile plain, near the coast of Guinea. Pop. 20,000.

**ABORIGINES** (ab-o-rij'i-nēz). The name given in general to the earliest known inhabitants of a country, those who are supposed to have inhabited the land from the beginning (Lat. *ab origine*). (The singular of the word is *Aboriginal*, or sometimes *Aborigine.*)

**ABOUKIR** (à-bö-kēr'; ancient **ZEPHYRION**, near ruins of Canōpus). A small village on the Egyptian coast, 14½ miles north-east of Alexandria by rail. In Aboukir Bay took place the naval battle in which Nelson annihilated a French fleet on the night of 1st and 2nd Aug., 1798, thus totally destroying the naval power of France in the Mediterranean. Near this place, on 25th July, 1799, Napoleon defeated the Turks under Mustapha; and on 8th March, 1801, Sir Ralph Abercromby effected the landing of a British army against the French.

**ABOU-SIMBEL.** *See* IPSAMBUL.

**ABOUT** (à-bö), **Edmond François Valentin.** A French novelist and miscellaneous writer, born 14th Feb., 1828, died 17th Jan., 1885. He was

educated at the Lycée Charlemagne and the École Normale, Paris; and was sent at Government expense to the French school at Athens; on his return to Paris, he devoted himself to literature. Principal novels: *Tolla, Le Roi des Montagnes, Germaine, Madelon, Le Fellah, La Vieille Roche, L'Infâme, Les Mariages de Province, Le Roman d'un Bravc Homme* (against Zola and the naturalist school), etc.; miscellaneous works: *La Grèce Contemporaine, La Question Romaine, La Prusse en* 1860, *Rome Contemporaine*, etc. In 1884 he was elected a member of the Academy. About wrote in a bright, humorous, and interesting style, and his novels have been very popular.

**ABOYNE** (a-boin'). Village of Aberdeenshire, sometimes called Charleston. It is famous for its castle, a seat of the Gordons. It is 11¼ miles from Ballater, and is on the L.N.E. Rly. Highland games are held here every year. Pop. 1552.

**ABRACADAB'RA.** A word of Eastern origin used in incantations. When written on paper so as to form a triangle, the first line containing the word in full, the one below it omitting the last letter, and so on each time until only one letter remained, and worn as an amulet, it was supposed to be an antidote against certain diseases.

A B R A C A D A B R A
A B R A C A D A B R
A B R A C A D A B
A B R A C A D A
A B R A C A D
A B R A C A
A B R A C
A B R A
A B R
A B
A

**A'BRAHAM,** originally **ABRAM** (Assyrian *Aburamu*, lofty father). The greatest of the Hebrew patriarchs, was born at Ur in Chaldea in 2153 B.C. according to Hales, in 1996 B.C. according to Ussher, while Bunsen says he lived 2850 B.C. He migrated, accompanied by his wife Sarah and his nephew Lot, to Canaan, where he led a nomadic life, which extended over 175 years. His two sons, Isaac and Ishmael, were the progenitors of the Jews and Arabs respectively.

**ABRAHAM, Heights or Plains of.** *See* QUEBEC.

**ABRAHAM À SANTA CLARA.** A German pulpit orator, whose real name was Ulrich Megerle, born in 1644. As a preacher he acquired so great a reputation that, in 1669, he was appointed court-preacher in Vienna, where he died in 1709. His sermons are full of homely, grotesque humour, often of coarse wit, and impartial severity towards all classes of society. His principal work and masterpiece is *Judas, the Archknave* (4 vols.), 1686-95.

**ABRAHAMITES.** 1, A sect of Syrian Deists of the ninth century, whose doctrines were allied to those of the Paulicians.—2, A sect of Bohemian Deists of the late eighteenth century, who professed to be followers of John Huss and claimed that they followed the religion of Abraham before his circumcision. Believing in one God, they rejected the Trinity, and accepted nothing of the Bible except the Ten Commandments and the Lord's Prayer. Refusing to join either the Jewish or Christian folds, they were excluded from the edict of toleration promulgated by the Emperor Joseph II., and expelled to Transylvania in 1738. Some were martyred, others became Roman Catholics.

**ABRAHAM-MEN.** Originally a set of vagabonds who had been discharged from Bethlehem Hospital, London; but as many assumed, without right, the badge worn by them, the term came to signify an impostor who travelled about the country seeking alms, under the pretence of lunacy.

**ABRAM.** A town (urban district) of England, Lancashire, 3¼ miles from Wigan; a colliery centre. Pop. (1931), 6660.

**AB'RAMIS.** A genus of fishes. *See* BREAM.

**ABRAN'TES.** A fortified town of Portugal, on the right bank of the Tagus (here navigable), 73 miles north-east of Lisbon, with which it carries on an active trade. Pop. 10,000.

**ABRANTES, Duke of.** *See* JUNOT.

**ABRĀS'IVE.** Polishing material employed in many manufacturing industries. Carborundum and emery are examples, both being used in preparing metal. A grindstone is an abrasive and so is pumice stone. Artificial abrasives are now made by electric power.

**ABRAX'AS (or ABRASAX) STONES.** The name given to stones or gems found in Syria, Egypt, and elsewhere, cut into almost every variety of shape, but generally having a human trunk and arms, with a cock's head, two serpents' tails for the legs, etc., and the mystico-theosophical word Abraxas or Abrasax in Greek characters engraved upon them. Eventually they came to be used as charms and amulets. Basilides (A.D. 130) and

other gnostics gave the name of Abraxas to Almighty God, the Supreme Deity, since the numerical value of its letters in Greek gave the sum of 365, and they believed that 365 orders of spirits emanated from God. Not all abraxas stones, however, are of gnostic origin, just as the name of abraxas cannot be applied to all gnostic stones. Cf. King: *The Gnostics and their Remains*, London, 1887.

**ABRIN,** or **ABRINE.** A poisonous substance, being the active principle in the seeds of *Abrus precatorius* (*see* ABRUS). A minute quantity introduced into the blood is fatal to many animals, but it is employed in ailments of the eyes, and as a remedy for lupus and certain skin diseases.

**ABROGA'TION.** The repealing of a law by a competent authority.

**ABROLHOS** (a-brole'-yoce). A group of rocky islands 50 miles off the east coast of Brazil, the largest of which is Santa Barbara. Another group called Abrolhos lies off the west coast of Australia.

**ABRO'MA.** A genus of small trees, natives of India, Java, etc., one species of which, *A. augusta*, has a bark yielding a strong white fibre, from which good cordage is made.

**ABRUPT'.** In botany, terminating suddenly, as if a part were cut short off.

**AB'RUS.** A genus of papilionaceous plants, order Leguminosæ, one species of which, *Abrus precatorius*, a delicate twining shrub, a native of the East Indies, and found also in tropical parts of Africa and America, has round brilliant scarlet seeds, used to make necklaces and rosaries. Its root is sweetish and mucilaginous, and is used as a substitute for liquorice (*Indian liquorice*). The seeds yield a strong poison.

**ABRUZZI** (à-brut'sē). A division of Italy on the Adriatic, between Umbria and the Marches on the north, and Apulia on the south. It is united with Molise to form a *compartimento*, comprising the four provinces of Aquila degli Abruzzi, Campobasso, Chieti, and Teramo. The sea-coast of about 100 miles does not possess a single harbour. The interior is rugged and mountainous, being traversed throughout by the Apennines. The lower parts consist of fertile plains and valleys, yielding corn, wine, oil, almonds, saffron, etc.; area, 5951 sq. miles. Pop. 1,497,048.

**AB'SALON,** or **AXEL.** A Danish prelate, statesman, and warrior, born in 1128, died 1201. He became the intimate friend and counsellor of his sovereign Waldemar I., who appointed him Archbishop of Lund. He cleared the sea of the Slavonic pirates who had long infested it, secured the independence of the kingdom by defeating a powerful fleet of the Emperor Barbarossa, and built the castle of Axelborg, the nucleus of Copenhagen. He ultimately became Primate of Denmark and Sweden. Turning his thoughts to literature he caused the *History of Denmark* to be drawn up by Saxo Grammaticus and Svend Aagesen.

**AB'SCESS.** Any collection of purulent matter or pus formed in some tissue or organ of the body, and confined within some circumscribed area, of varying size, but always painful and often dangerous.

**AB'SINTH,** French *Absinthe* (ăb-sant). A liqueur consisting of an alcoholic solution strongly flavoured with an extract of several sorts of wormwood, oil of anise, etc. When taken habitually, or in excess, its effects are very pernicious. A favourite drink of the Parisians, it was suppressed entirely throughout France by a law passed on 12th Feb., 1915.

**ABSOLU'TION.** Remission of a penitent's sins in the name of God. It is commonly maintained that down to the twelfth century the priests used only what is called the *precatory* formula, "May God or Christ absolve thee," which is still the form in the Greek Church; whereas the Roman Catholic uses the expression "I absolve thee," thus regarding the forgiveness of sins as in the power of the priest (the *indicative* form). This theory of absolution was confirmed by the Council of Trent. The passages of Scripture on which the Roman Catholic Church relies in laying down its doctrine of absolution are such as *Mat.* xvi. 19, xviii. 18; *John* xx. 23. Among Protestants absolution properly means a sentence by which a person who stands excommunicated is released from that punishment.

**ABSOLUTISM.** A system of government in which the supreme power is vested in a ruler not controlled or limited by any constitution or laws. It has prevailed in Oriental countries, including Japan, until the latter part of the nineteenth century. There are now no absolute monarchies in Europe.

**ABSOR'BENTS.** The system of minute vessels by which the nutritive elements of food and other matter

are carried into the circulation of vertebrate animals. The vessels consist of two different sets, called respectively *lacteals* and *lymphatics*. The former arise from the digestive tract, the latter from the tissues generally, both joining a common trunk which ultimately enters the blood-vessel system. **Absorbents in medicine** are substances such as chalk, charcoal, etc., that absorb or suck up excessive secretion of fluid or gas.

**ABSORP'TION.** In physiology, one of the vital functions by which the materials of nutrition and growth are absorbed and conveyed to the organs of plants and animals. In vertebrate animals this is done by the lymphatics and lacteals, in plants chiefly by the roots. *See* ABSORBENTS.

In physics, *absorption of colour* is the phenomenon observed when certain colours are retained or prevented from passing through transparent bodies; thus pieces of coloured glass are almost opaque to some parts of the spectrum, while allowing other colours to pass through freely. In chemistry absorption is the taking up of a gas by a liquid, or by a porous solid.

**AB'STINENCE.** *See* FASTING, TEMPERANCE.

**ABU** (*a*-bö'). A granitic mountain of India in Sirohi State, Rajputána, rising precipitously from the surrounding plains, its top forming a picturesque and varied tract 14 miles long and 2 to 4 broad; highest point 5653 ft. It is a hot-weather resort of Europeans, and is the site of two most beautiful Jain temples, built in 1031 and 1200.

**ABU-BEKR,** or **FATHER OF THE VIRGIN.** Born 570, died 634, the father-in-law and first successor of Mahomet. His right to the succession was unsuccessfully contested by Ali, Mahomet's son-in-law, and a schism took place, which divided the Mahommedans into the two great sects of Sunnites and Shiites, the former maintaining the validity of Abu-Bekr's and the latter that of Ali's claim.

**ABUKIR'.** *See* ABOUKIR.

**ABU KLEA.** A group of wells, surrounded by steep, black mountains, about 120 miles from Khartoum, in the Sudan, where, on the 17th Jan., 1885, Sir Herbert Stewart, with 1500 men, defeated the Mahdi's troops numbering 10,000.

**ABULFARA'GIUS, Gregory.** A distinguished scholar, a Jew by birth (hence the name of *Barhebræus*, often given him), author of numerous works in Arabic and Syriac, was born in Armenia in 1226, died in 1286. About 1264 he was consecrated Bishop of Gubas; he was afterwards translated to Aleppo and was appointed primate of the Jacobite Christians. His principal work is a *History of the World* from the Creation to his own day, written in Syriac, with an abridged version in Arabic, entitled *The Abridged History of the Dynasties.*

**ABUL'FEDA.** Arab writer, Prince of Hamah, in Syria, of the same family as Saladin, famous as an historian and geographer, was born at Damascus 1273, died 1331. Amid the cares of government he devoted himself with zeal to study, drew the learned around him, and rendered his power and wealth subservient to the cause of science. His most important works are his *History of the Human Race* (the portion from the birth of Mahomet to his own time being valuable), and his geography called *The True Situation of Countries.*

**ABUNDA.** A Bantu race of Angola, living on the coastlands and on the terraces rising towards the interior, and divided into "highlanders" and "lowlanders." They speak Portuguese and Umbunda, a trade language.

**ABUSHEHR** (ä-bö-shär'). *See* BUSHIRE.

**ABU-SIMBEL.** *See* IPSAMBUL.

**ABU'TILON.** A genus of plants, order Malvaceæ, sometimes called Indian mallows, found in the East Indies, Australia, Brazil, Siberia, etc. Several of them yield a valuable hemp-like fibre, as *A. indicum* and *A. Avicennæ.* The latter, now a troublesome weed in the Middle United States, has been recommended for cultivation, and is sometimes called American jute.

**ABUT'MENT.** The part of a bridge which receives and resists the lateral outward thrust of an arch; the masonry, rock, or other solid materials from which an arch springs.

**ABY'DOS.** 1, an ancient city of Asia Minor, on the Hellespont, at the narrowest part of the strait, opposite Sestos. Leander, say ancient writers, swam nightly from Abydos to Sestos to see his loved Hero—a feat in swimming accomplished also by Lord Byron.—2, an ancient city of Upper Egypt (Egyptian Abotu), about 6 miles west of the Nile, now represented only by ruins of temples, tombs, etc. It was celebrated as the burial-place of the god Osiris, and its

oldest temple was dedicated to him. Here, in 1818, was discovered the famous *Abydos Tablet*, now in the British Museum, and containing a list of the predecessors of Rameses the Great, which was supplemented by the discovery of a similar historical tablet in 1864. The tomb of Osiris was discovered in 1898 by Amélinau. Cf. Flinders Petrie, *The Royal Tombs of the Earliest Dynasties* (2 vols.), London, 1900-9.

**ABYSSIN'IA** (Ar. *Habesha*). A country of Eastern Africa, which, with dependencies, may be said to extend from lat. 5° to 15°N. and long. 35° to 42° E., having the Anglo-Egyptian Sudan on the W., Kenya on the S., and on the S.E. and E. Somali-land and Eritrea (Italian Red Sea coast); area, 350,000 sq. miles; pop. over 10,000,000. The country includes the former kingdoms of Tigré, Amhara, Gojjam, and Shoa, many smaller and formerly independent territories, and the Harrar, Galla, Shankalla, and Dankali territories. Modern Abyssinia is divided into a large number of provinces. Each province is governed by a *ras* or prince.

**Physical Features.** Abyssinia proper is an elevated region, with a general slope to the north-west. The more marked physical features are a vast series of tablelands, of various and often of great elevations, and numerous masses or ranges of high and rugged mountains, dispersed over the surface in apparently the wildest confusion. Along the deep and tremendous ravines that divide the plateaux rush innumerable streams, which impart extraordinary fertility to the plains and valleys below. The mountains in various parts of the country rise to 12,000 and 13,000 feet, while some of the peaks are over 15,000 feet (Ras Dashan being 15,160), and are always covered with snow. The principal rivers belong to the Nile basin, the chief being the impetuous Tacazzé ("the Terrible") in the north, and the Abai in the south, the latter being really the upper portion of the Blue Nile. The principal lake is Lake Tsana or Dembea (from which issues the Abai), upwards of 6000 feet above the sea, having a length of about 45 and a breadth of 35 miles. Round this lake lies a fertile plain, deservedly called the granary of the country.

**Vegetation.** According to elevation there are several zones of vegetation. Within the lowest belt, which reaches an elevation of 4800 feet, cotton, wild indigo, acacias, ebony, baobabs, sugar-canes, coffee trees, date palms, etc., flourish, while the larger animals are lions, panthers, elephants, rhinoceroses, hippopotamuses, jackals, hyenas, bears, numerous antelopes, monkeys, and crocodiles. The middle zone, rising to 9000 feet, produces the grains, grasses, and fruits of southern Europe, the orange, vine, peach, apricot, the bamboo, sycamore tree, etc. The principal grains are millet, barley, wheat, maize, and teff, the latter a small seed, a favourite bread-stuff of the Abyssinians. Two, and in some places three, crops are obtained in one year. All the domestic animals of Europe, except swine, are known. There is a variety of ox with immense horns. The highest zone, reaching to 14,000 feet, has but little wood, and generally scanty vegetation, the hardier corn-plants only being grown; but oxen, goats, and long-woolled sheep find abundant pasture.

**Climate.** The climate is as various as the surface, but as a whole is temperate and agreeable; in some of the valleys the heat is often excessive, while on the mountains the weather is cold. In certain of the lower districts malaria prevails.

**Minerals.** The chief mineral products are sulphur, copper, coal, and salt, the last-named serving to some extent as money. Iron is very abundant and is manufactured into knives, hatchets, and spears.

**People.** There has been a great intermixture of races in Abyssinia. Those who may be considered the Abyssinians proper seem to have a blood-relationship with the Bedouin Arabs. Their complexion varies from very dark through different shades of brown and copper to olive, and they are usually well built. Other races are the black Gallas from the south; the Falashas, who claim descent from Abraham and retain many Jewish characteristics; the Agows, Gongas, etc. The great majority of the people profess Christianity, belonging, like the Copts, to the sect of the Monophysites. The head of the church is called the Abuna ("our father"), and is consecrated by the Coptic patriarch of Alexandria. Geez or Ethiopian is the language of their sacred books: it has long ago ceased to be spoken. The chief spoken language is the Amharic, in it some books have been published. Mohammedanism appears to be gaining ground in Abyssinia. A corrupt form of Judaism is professed by the Falashas.—The bulk of the people are devoted to agriculture and cattle-breeding.

**Trade.** The trade and manufactures are of small importance. A good deal of common cotton cloth and some

finer woven fabrics are produced. Leather is prepared to some extent, silver filigree-work is produced, and there are manufactures of common articles of iron and brass, pottery, etc. Trade is carried on through Zeila and Jibouti (French Ethiopian Railway was completed in 1915) on the Gulf of Aden, and Massawa on the Red Sea (Italian), exports being hides, coffee, wax, gum, ivory, etc., imports textile fabrics, etc.

**History.** The Abyssinians were converted to Christianity in the fourth century, by some missionaries from Alexandria. In the sixth century the power of the sovereigns of their kingdom, which was generally known as Ethiopia, had attained its height; but before another had expired the Arabs had invaded the country, and obtained a footing. For several centuries subsequently the kingdom continued in a distracted state, being now torn by internal commotions and now invaded by external enemies (Mahommedans and Gallas). To protect himself from the latter the Emperor of Abyssinia applied, about the middle of the sixteenth century, to the King of Portugal for assistance, promising, at the same time, implicit submission to the Pope. The solicited aid was sent, and the empire saved.

The Roman Catholic priests endeavoured to induce the emperor and his family to renounce the tenets and rites of the Coptic Church, and to adopt those of Rome. This attempt, however, was resisted by the ecclesiastics and the people, and ended, after a long struggle, in the expulsion of the Catholic priests about 1630.

The kingdom gradually fell into a state of anarchy, and was broken up into several independent States. An attempt to revive the power of the ancient kingdom of Ethiopia was made by King Theodore about the middle of the last century. He introduced European artisans, and went to work wisely in many ways, but his cruelty and tyranny counteracted his politic measures. In consequence of a slight, real or fancied, which he had received at the hands of the British Government, he threw Consul Cameron and a number of other British subjects into prison, in 1863, and refused to give them up.

To effect their release an army of nearly 12,000 men, under Sir Robert (afterwards Lord) Napier, was dispatched from Bombay in 1867. The force landed at Zoulla on the Red Sea, and marching up the country came within sight of the hill-fortress of Magdala in April, 1868. After being defeated in a battle, Theodore delivered up the captives and shut himself up in Magdala, which was taken by storm on the 13th April, Theodore being found among the slain.

After the withdrawal of the British, fighting immediately began among the chiefs of the different provinces, but at last the country was divided between Kasa, who secured the northern and larger portion (Tigré and Amhara) and assumed the name of King Johannes, and Menelek, who gained possession of Shoa. Latterly Johannes made himself supreme, and in 1881 assumed the title of emperor (*negus negusti*—king of kings). Johannes was succeeded in 1889 by Menelek II. In 1916 Lij Yasu, who succeeded Menelek II. in 1913, was deposed and Waizeru Zauditu became empress. She was crowned in 1917, and Ras Taffari, a great-nephew of Menelek II. (Zauditu's father) was proclaimed heir. He acted as Regent till 1930 when Zauditu died and he succeeded as *negus negusti*. The government is feudal in character, but a modified form of cabinet government was introduced in 1919. Britain, Italy, and France have clearly defined spheres of influence in Abyssinia.

BIBLIOGRAPHY: C. F. Rey, *Unconquered Abyssinia*; *The Geographical Journal* (various years).

**ACA'CIA.** A genus of plants, nat. ord. Leguminosæ, sub-order Mimoseæ, consisting of trees or shrubs with compound pinnate leaves and small leaflets, growing in Africa, Arabia, the East Indies, Australia, etc. The flowers, usually small, are arranged in spikes or globular heads at the axils of the leaves near the extremity of the branches. The corolla is bell or funnel-shaped; stamens are numerous; the fruit is a dry unjointed pod. Several of the species yield gum-arabic and other gums; some having astringent barks and pods, used in tanning. *A. Catechu*, an Indian species, yields the valuable astringent called catechu. *A. dealbāta*, the wattle tree of Australia, from 15 to 30 feet in height, is the most beautiful and useful of the species found there. Its bark contains a large percentage of tannin, and is exported in large quantities. Some species yield valuable timber; some are cultivated for the beauty of their flowers.

**ACAD'EMY.** An association for the promotion of literature, science, or art; established sometimes by Government, sometimes by the voluntary union of private in-

dividuals. The name Academy was first applied to the philosophical school of Plato, from the place where he used to teach, a grove or garden at Athens which was said to have belonged originally to the hero Academus. The home of Academies as associations of learned men (not institutes for instruction), was Hellenised Egypt and afterwards Italy of the Renaissance. The flourishing Academies at Florence, Naples, and Rome became the models of academies in other countries. Academies devote themselves either to the cultivation of science generally or to the promotion of a particular branch of study, as antiquities, language, and the fine arts.

The most celebrated institutions bearing the name of academies, and designed for the encouragement of science, antiquities, and language respectively, are the French Académie des Sciences (founded by Colbert in 1666), Académie des Inscriptions (founded by Colbert in 1663), and Académie Française (founded by Richelieu in 1635), all of which are now merged in the National Institute. The most celebrated of the academies instituted for the improvement of language is the Italian Accademia della Crusca, or Furfuratorum (now the Florentine Academy), formed in 1582, and chiefly celebrated for the compilation of an excellent dictionary of the Italian language (*Vocabulario della Crusca*, Venice, 1612), and for the publication of several carefully-prepared editions of ancient Italian poets. The (Imperial) Academy of Science of St. Petersburg was projected by Peter the Great and established by Catherine I. in 1725. The Academy of Science in Berlin was founded by Frederick I. in 1700. It was opened in 1711 and had Leibnitz as its first president.

In Britain the name of academy, in the more dignified sense of the term, is confined almost exclusively to certain institutions for the promotion of the fine arts, such as the Royal Academy of Arts and the Royal Scottish Academy. The Royal Academy of Arts (usually called simply the Royal Academy) was founded in London in 1768, "for the purpose of cultivating and improving the arts of painting, sculpture, and architecture." The number of academicians is now limited to forty-two, among whom are two engravers. There are also thirty associates, from whom the academicians are elected. Of the associates five are engravers. Any person who is possessed of sufficient proficiency may be admitted as a student and receive instruction gratis, and prizes are annually bestowed on meritorious students. The annual exhibition of the Academy is open to all artists whose works show sufficient merit.

The Royal Scottish Academy of Painting, Sculpture, and Architecture was founded in 1826 and incorporated in 1838. It consists of thirty academicians and twenty associates. The Royal Hibernian Academy at Dublin was incorporated in 1823 and reorganised in 1861. It consists of thirty members and ten associates. A British Academy for the Promotion of Historical, Philosophical, and Philological Studies was incorporated in 1902. (*See* BRITISH ACADEMY). In the United States, the American Academy of Arts and Sciences at Boston was founded in 1780, and since then various other societies of similar character and name have been instituted, as the New York Academy of Sciences, the Chicago Academy of Science, etc.

**ACA'DIA** (Fr. *Acadie*). The name formerly given to Nova Scotia. It received its first colonists from France in 1604, being then a possession of that country, but it passed to Britain, by the Peace of Utrecht, in 1713. In 1756, 18,000 of the French inhabitants were forcibly removed from their homes on account of their hostility to the British, an incident on which is based Longfellow's *Evangeline*. Many Acadians afterwards wandered back to their old homes, and their descendants are at present supposed to number 270,000; 100,000 of them living in French Canada.

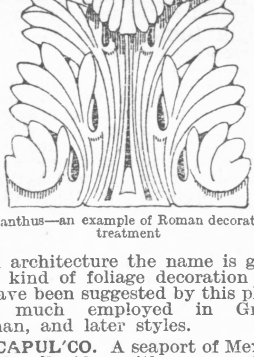
**ACALE'PHA** (Gr. *akalēphē*, a nettle, from their stinging properties). A term formerly used to denote the Medusæ, or jelly-fishes, and allied species.

**ACANTHA'CEÆ, or ACANTHADS.** A nat. ord. of dicotyledonous herbaceous plants or shrubs, with opposite leaves and monopetalous corolla, mostly tropical; species about 1400. *See* ACANTHUS.

**ACANTHOP'TERI, ACANTHOPTERYGII** (Gr. *akantha*, a spine, *pterygion*, a fin). A group of fishes distinguished by the fact that at least the first rays in each fin exist in the form of stiff spines; it includes the perch, mullet, mackerel, gurnard, wrasse, etc.

**ACANTH'US.** A genus of herbaceous plants or shrubs, order Acanthaceæ, mostly tropical, two species of which, *A. mollis* and *A. spinōsus* (the bear's-breech or brank-

ursine), are characterised by large white flowers and deeply-indented shining leaves. They are favourite ornamental plants in British gardens.



Acanthus—an example of Roman decorative treatment

In architecture the name is given to a kind of foliage decoration said to have been suggested by this plant, and much employed in Greek, Roman, and later styles.

**ACAPUL'CO.** A seaport of Mexico, on the Pacific, with a capacious, well-sheltered harbour; a coaling station for steamers, but with no great trade. Pop. 6000.

**ACAR'IDA.** A division of the Arachnida, including the mites, ticks, and water-mites. *See* MITE.

**ACARNA'NIA.** The most westerly portion of Northern Greece, together with Ætolia now forming a nomarchy with a pop. of 199,305. The Acarnanians of ancient times were behind the other Greeks in civilization, living by robbery and piracy.

**AC'ARUS.** The genus to which the mite belongs.

**ACCA'DIANS** (Akkad). The primitive inhabitants of Northern Babylonia (Akkad), who had descended from the mountainous region of Elam on the east, and to whom the Assyrians ascribed the origin of Chaldean civilisation and writing. This race is believed to have belonged to the Turanian family, or to have been at any rate non-Semitic. What is known of them has been learned from the cuneiform inscriptions. *See* BABYLONIA and SUMMERIANS.

**ACCELERA'TION.** Is the rate of change of the velocity of a body under the action of a force. A body falling from a height is one of the most common instances of acceleration.

**Acceleration of the Moon.** The increase of the moon's mean angular velocity about the earth, the moon now moving rather faster than in ancient times. This phenomenon has not been fully explained, but it is known to be partly owing to the slow process of diminution which the eccentricity of the earth's orbit is undergoing, and from which there results a slight diminution of the sun's influence on the moon's motions.

**Diurnal accceleration of the fixed stars.** The apparent greater diurnal motion of the stars than of the sun, arising from the fact that the sun's apparent yearly motion takes place in a direction contrary to that of his apparent daily motion. The stars thus seem each day to anticipate the sun by nearly 3 minutes 56 seconds of mean time.

**ACCEN'TOR** (*Accentor modulāris*), or **HEDGE ACCENTOR.** A British bird of the warbler family. *See* HEDGE WARBLER.

**ACCEP'TANCE.** Is a stage in the making of contracts. An offer is made and a contract follows only when the acceptance is unqualified. —**Acceptance of drafts,** the act by which a person binds himself to pay a bill of exchange (q.v.) drawn upon him. No acceptance is valid unless made in writing on the bill, but an acceptance may be either "general" or "qualified."

**AC'CESSARY,** or **AC'CESSORY.** In law, a person guilty of an offence by connivance or participation, either before or after the act committed, as by command, advice, concealment, etc. An accessary *before the fact* is one who procures or counsels another to commit a crime, and is not present at its commission; an accessary *after the fact* is one who, knowing a felony to have been committed, gives assistance of any kind to the felon so as to hinder him from being apprehended, tried, or suffering punishment. An accessary before the fact may be tried and punished in all respects as if he were the principal. In high treason, all who participate are regarded as principals.

**ACCIDEN'TALS.** Notes introduced in the course of a piece of music in a different key from that in which the passage where they occur is principally written. They are represented by the sign of a sharp, flat, or natural immediately before the note which is to be raised or lowered.

**ACCIPITRES** (ak-sip'i-trēz). The name given by Linnæus and Cuvier to the rapacious birds now usually called Raptores (q.v.).

**ACCLIMATIZA'TION.** The process of accustoming plants or animals to

live and propagate in a climate different from that to which they are indigenous, or the change which the constitution of an animal or plant undergoes under new climatic conditions, in the direction of adaptation to those conditions. The systematic study of acclimatization has only been entered upon in very recent times, and the little progress that has been made in it has been more in the direction of formulating anticipative, if not arbitrary hypotheses, than of actual discovery and acquisition of facts. The best-known society founded, for the purpose of naturalizing animals and plants, is the Société d'Acclimatation in Paris. It opened the Jardin d'Acclimatation in 1860. *See* TROPICAL HYGIENE.

The term is sometimes applied to the case of animals or plants taking readily to a new country with a climate and other circumstances similar to what they have left, such as European animals and plants in America and New Zealand: but this is more properly *naturalization* than acclimatization.

In agriculture the word is used with reference to stock, principally sheep, "acclimatized" to a particular area, a special allowance being made by the landlord on transference of the farm and stock in respect of the acclimatization of the sheep. The value assigned to the advantages resulting from acclimatization of stocks varies considerably. In Argyllshire, for instance, Dumbartonshire, and the western portion of Perthshire the rates are high, while in the south of Scotland and the north of England they are much lower.

**ACCOLADE** (ak-o-lād'; Fr., from Lat. *ad*, to, *collum*, the neck). The ceremony used in conferring knighthood, anciently consisting either in the embrace given by the person who conferred the honour of knighthood or in a light blow on the neck or the cheek, latterly consisting in the ceremony of striking the candidate with a naked sword.

**ACCOLTI, Benedetto.** An Italian lawyer, born at Arezzo in Tuscany in 1415, died at Florence in 1466. He was secretary to the Florentine republic, 1459, and author of a work on the Crusades which is said to have furnished Tasso with matter for his *Jerusalem Delivered*.

**ACCOMMODATION BILL.** A bill of exchange drawn and accepted to raise money on, and not given, like a genuine bill of exchange, in payment of a debt, but merely intended to accommodate the drawer: colloquially called a *wind bill* and a *kite*.

**ACCOMMODATION LADDER.** A light ladder hung over the side of a ship at the gangway to facilitate ascending from, or descending to, boats.

**ACCOMPANIMENT.** In music, is that part of music which serves for the support of the principal melody.

**ACCORDION.** A keyed musical wind-instrument similar to the concertina, being in the form of a small box, containing a number of metallic reeds fixed at one of their extremities, the sides of the box forming a folding apparatus which acts as a bellows to supply the wind, and thus set the reeds in vibration, and produce the notes both of melody and harmony. The accordion was invented by Damian of Vienna in 1829.

**ACCOUNTANCY.** The profession of one who deals with accounts. It is an open one, that is, any person can practise accountancy in the United Kingdom without being required to hold any qualifications. He will, however, have a better chance of success if he qualifies for membership of one of the leading Institutes or Societies, which are as follows:—

(1) The Institute of Chartered Accountants of England and Wales; chief office in London.
(2) The Institutes of Chartered Accountants in Scotland, of which there are three, with offices in Edinburgh, Glasgow, and Aberdeen.
(3) The Society of Incorporated Accountants and Auditors, with its headquarters in London.

Membership of (1) and (2) secures the right to the title "Chartered Accountant"; in the case of (1) the distinctive letters F.C.A. and A.C.A. may be used; in the case of (2), the letters C.A. Members of the Society of Incorporated Accountants and Auditors use the letters F.S.A.A. and A.S.A.A. respectively, and are styled "Incorporated Accountants."

In the case of the Chartered Accountant, five years' service under Articles (reduced in the case of graduates of the universities of the United Kingdom to three years) is essential. Before commencing service under Articles, the prospective articled clerk must pass a Preliminary Examination in general educational subjects, unless he can produce certificates showing that he has satisfactorily passed another examination of that character in the subjects which are required, Mathematics in every case being essential.

The Society of Incorporated Accountants and Auditors admits to its

intermediate examination accountancy clerks to public accountants who have passed the Preliminary Examination, and have completed six years approved professional service. These candidates, when they have passed the intermediate examination and have attained the age of 25 and completed nine years approved professional service as accountancy clerks to public accountants, are permitted to sit for the Final.

The employer generally requires the payment of a premium which may be anything from 100 to 300 guineas, according to the standing of the firm, and may even amount to 500 guineas. The conditions of service may also provide for no salary during service, but since the War it has become largely the practice for a part, if not the whole, of the premium to be repaid as salary during the period of service.

The Preliminary Examination of the English Institute includes English, Mathematics, History, Geography, and two optional subjects selected from a long list, one of which must be a language. The Intermediate Examination, which is taken after half the term of service has expired, is in professional subjects including Book-keeping, the Accounts of Limited Companies, Partnership and Executorship Accounts, Auditing and General Commercial Knowledge, whilst the Final Examination, which is taken two years after passing the Intermediate Examination (one year in the case of graduates) and at the termination of the service, is of a more advanced nature in the above professional subjects with the addition of papers set in the Principles of the Law of Bankruptcy, Arbitrations and Awards, Mercantile Law, Costing and Taxation, and the Principles of Banking or Economics.

The salary of a moderately successful Accountant is, say, from £600 to £1000 per annum, but many are much more successful than this. It is usual after passing the examinations to serve with a firm of Accountants at an annual salary which may commence at £200 to £300 a year, whilst many very valuable mercantile posts and appointments in financial houses are open to those who can show an Accountancy qualification of the above description.

**ACCOUNTANT.** A person whose chief business is with accounts and the drawing up of financial statements and balance-sheets. An accountant is an important official in banks, railways, and certain other institutions, and many persons carry on the business of accountant as a distinct profession, auditing the books of merchants, joint-stock companies, etc. There are several bodies of accountants in the United Kingdom incorporated by royal charter, and hence specially distinguished as "chartered accountants" (C.A.). Since 1919 women are admitted as members of the Society of Incorporated Accountants.— BIBLIOGRAPHY: L. R. Dicksee, *Advanced Accounting*; G. Lisle, *Encyclopædia of Accounting* (8 vols.).

**AC'CRA.** A British settlement in Africa, in a swampy situation, capital of Gold Coast, about 75 miles east of Cape Coast Castle. Exports gold-dust, ivory, gums, palm-oil; imports cottons, cutlery, etc. Pop. 59,895.

**AC'CRINGTON.** A municipal borough of England, Lancashire, 5 miles east of Blackburn, with large cotton factories, print-works and bleaching-greens, and coal-mines. Pop. (1931), 42,973. Accrington was created a parliamentary borough in 1918.

**ACCU'MULATOR.** A name applied to a kind of electric battery by means of which electric energy can be stored and rendered portable. In the usual form each battery forms a cylindrical leaden vessel, containing alternate sheets of metallic lead and miniun wrapped in felt and rolled into a spiral wetted with acidulated water. On being charged with electricity the energy may be preserved till required for use.

**ACE.** In aviation the name "ace" is given to a flying-man who has distinguished himself by bringing down a large number (sometimes given as ten) of enemy machines. The word is used colloquially, and was borrowed from the French Air Force during the European War.

**ACEL'DAMA.** Field purchased with the thirty pieces of silver given to Judas Iscariot for the betrayal of Christ.

**ACEPH'ALA.** In zoology, the headless Mollusca or those which want a distinct head, corresponding to those that have bivalve shells and are also called *Lamellibranchiata*.

**A'CER.** The genus of plants (nat. ord. Aceraceæ) to which belongs the maple.

**ACERRA** (à-cher'à). A town in South Italy, 9 miles north-east of Naples, the see of a bishop, in a fertile but unhealthy region. Pop. 16,460.

**ACETAB'ULUM.** An anatomical term applied to any cup-like cavity, as that of a bone to receive the protuberant end of another bone, the

cavity, for instance, that receives the end of the thigh-bone.

**ACETAL.** Colourless liquid. It is found in alcohol and is obtained by distilling a mixture of alcohol, manganese dioxide, sulphuric acid and water. The flavour of good wine is partly due to acetal. Its chemical formula is $C_6H_{14}O_2$.

**ACETATES** (as'e-tāts). Salts of acetic acid. The acetates of most commercial or manufacturing importance are those of aluminium and iron, which are used in calico-printing; of copper, which as verdigris is used as a colour; and of lead, best known as sugar of lead. The acetates of potassium, sodium, and ammonium, of iron, zinc, and lead, and the acetate of morphia, are employed in medicine.

**ACET'IC ACID.** An acid produced by the oxidation of common alcohol, and of many other organic substances. Pure acetic acid has a very sour taste and pungent smell, burns the skin, and is poisonous. From freezing at ordinary temperatures (58° or 59°) it is known as *glacial acetic acid*. Vinegar is simply dilute acetic acid. Acetic acid is largely used in the arts, in medicine, and for domestic purposes. *See* VINEGAR.

**ACET'IC ETHERS,** or **ACETIC ESTERS.** Acetates of alcohol radicals. The common ester—ethyl acetate—is a volatile colourless liquid, manufactured by distilling a mixture of alcohol, oil of vitriol, and acetic acid, and used for flavouring purposes.

**ACETONE** (as'). A constituent of ordinary wood spirit, a colourless volatile liquid used as a solvent, the simplest of the *ketones*.

**ACET'YLENE,** $C_2H_2$. Is a substance composed of two elements, carbon and hydrogen, and belonging to a class of compounds known as hydrocarbons. It is formed in the incomplete combustion of many hydrocarbons and also of coal-gas, and may be produced in a variety of ways, but is now made almost entirely from calcium carbide. Acetylene has been known for a long time, but only since 1870 has it been produced in any quantity.

After the development of the electric furnace it was found that calcium oxide, quicklime, heated with carbon to the high temperature possible in such a furnace, is transformed into calcium carbide, and this compound reacts with water, generating acetylene. A great deal of heat is developed on adding water to calcium carbide, so that care has to be taken in generating acetylene. Various devices are in use for bringing the two substances in contact slowly, and for keeping the temperature low. When carbon and hydrogen combine to form acetylene a large amount of heat is used up, so that much heat is evolved when acetylene decomposes again, and once decomposition starts sufficient heat is developed to decompose the whole volume of gas.

Acetylene is a colourless gas slightly soluble in water and very sparingly soluble in brine. When pure it has little or no odour, but as ordinarily prepared it has a strong unpleasant odour due to traces of impurities such as sulphuretted hydrogen, phosphine, etc. The gas can be liquefied easily, and in the liquid state is highly explosive. It burns with an exceedingly sooty flame, but if it is allowed to pass through a very small orifice the carbon liberated becomes incandescent and acetylene burns with an intense white flame.

It is largely used as an illuminant and for the production of great heat. As an illuminant the gas is produced in specially-constructed generators. It is led through iron pipes and burned from an acetylene burner, or it may be used with special types of incandescent mantles. Acetylene readily combines with copper and with silver to form metallic acetylides which are very explosive, hence pipes through which acetylene is passing must not be made of brass or copper. Acetylene mixed with air and brought in contact with an ignited body explodes even more violently than a mixture of air and coal-gas.

Large quantities of acetylene are generated and stored for oxy-acetylene welding. Acetylene, burning in oxygen, gives an intensely hot flame (about 2000°-3000° C.) sufficiently hot to melt iron. Although liquid acetylene is unstable, and even the gas, under slight pressure, is also unstable, it may be transported safely if dissolved in acetone. Acetone dissolves a large volume of acetylene, and this solution is quite stable and may be stored in iron cylinders and used for various purposes. If it is to be stored it must be carefully purified from phosphine, which is apt to cause sudden decomposition. Recently, numerous patents have been taken out for the preparation of compounds such as acetaldehyde, acetic acid, acetic anhydride, etc., using acetylene as starting-point, so that many substances may be prepared from acetylene just as many substances may be prepared from benzene.

**ACHÆANS** (a-kē'anz). One of the four races into which the ancient Greeks were divided. In early times they inhabited a part of Northern Greece and of the Peloponnesus. They are represented by Homer as a brave and warlike people, and so distinguished were they that he usually calls the Greeks in general Achæans. Afterwards they settled in the district of the Peloponnesus, called after them Achaia, and forming a narrow belt of coast on the south side of the Gulf of Corinth.

From very early times a confederacy or league existed among the twelve towns of this region. After the death of Alexander the Great it was broken up, but was revived again, 280 B.C., and from this time grew in power till it spread over the whole Peloponnesus. It was finally dissolved by the Romans, 147 B.C., and after this the whole of Greece, except Thessaly, was called Achaia or Achæa. Achaia with Elis now forms a nomarchy of the kingdom of Greece. Pop. 254,728. Cf. Freeman, *History of Federal Government in Greece and Italy*, London, 1893.

**ACHÆMENIDÆ** (ak-ē-men'i-dē). A dynasty of ancient Persian kings, being that to which the great Cyrus belonged.

**ACHAIA** (a-kā'ya). *See* ACHÆANS.

**ACHALZIK.** *See* AKHALZIK.

**ACHARD** (ȧh'ȧrt), **Franz Karl.** A German chemist, born 1753, died 1821, principally known by his invention (1789-1800) of a process for manufacturing sugar from beetroot. In 1801 the first beet-sugar factory ever established was started by him in Silesia.

**ACHARD** (ȧ-shȧr), **Louis Amédée Eugène.** Born 1814, died 1875, French journalist, novelist, and playwright. He was best known as a novelist; wrote the novels *Belle Rose*, *La Chasse royale*, *Châteaux en Espagne*, *Robe de Nessus*, *Chaînes de fer*, etc. His *Lettres Parisiennes* were published in 1838 under the pseudonym of Grimm.

**ACHATES** (a-kā'tēz). A companion of Æneas in his wanderings subsequent to his flight from Troy. He is always distinguished in Virgil's *Æneid* by the epithet *fidus*, "faithful," and has become typical of a faithful friend and companion.

**ACHEEN,** or **ACHIN** (ȧ-chēn') (Du. *Atjeh*). A native state of Sumatra, with a capital of the same name, in the north-western extremity of the island, now nominally under Dutch administration. Though largely mountainous, it has also undulating tracts and low fertile plains. By treaty with Britain the Dutch were prevented from extending their territory in Sumatra by conquest; but this obstacle being removed, in 1871 they proceeded to occupy Acheen. It was not till 1579, however, after a great waste of blood and treasure, that they obtained a general recognition of their authority. But they have not been able to establish it firmly, and have had to put down many determined risings, sometimes costing them losses both in men and guns. In the seventeenth century Acheen was a powerful State, and carried on hostilities successfully against the Portuguese, but its influence decreased with the increase of the Dutch power. The principal exports are rice and pepper. Area, 20,544 sq. miles; pop. 736,365.

**ACHELOUS** (ak-e-lō'us) (now **ASPROPOTÁMO**). The largest river of Greece, rising on Mount Pindus, separating Ætolia and Acarnania and flowing into the Ionian Sea. In Greek legend, Achelōus, the son of Oceanus and Tethys, was the river-god.

**ACHENBACH** (ȧ'hen-bȧch), **Andreas.** Was a distinguished German landscape and marine painter, born in 1815, died in 1910.

**ACHENBACH, Oswald.** Born 1827, died 1905, brother of above, was also a distinguished landscape painter. Both are of the Düsseldorf school, and pupils of the famous painter Schadow.

**ACHENE,** or **ACHENIUM** (a-kēn', a-kē'ni-um). In botany, a small, dry carpel containing a single seed, the pericarp of which is closely applied but separable, and which does not open when ripe. It is either solitary, or several achenia may be placed on a common receptacle as in the buttercup.

**ACHENSEE.** A lake in Tyrol, 20 miles north-east of Innsbruck and 3018 feet above sea-level. On its shores are beautiful villas and hotels frequented as summer resorts.

**ACHERON** (ak'e-ron) (modern **FANARIOTICOS**). The ancient name of several rivers in Greece and Italy, all of which were connected by legend with the lower world. The principal was a river of Thesprotia in Epirus, which passes through Lake Acherusia and flows into the Ionian Sea. Homer speaks of Acheron as a river of the lower world, and late Greek writers use the name to designate the lower world.

**ACHEULIAN.** A term applied by

archæologists to the late stage of Chellean civilization in the Pleistocene Age. It is named after St. Acheul in the Somme valley, where relics of it were found. The geological horizon, according to Professor James Geikie, is late Second Interglacial and Third Glacial periods.

**ACH'IAR, or AT'CHAR.** An Indian condiment made of the young shoots of the bamboo pickled.

**ACHI BABA.** Hill in Gallipoli. It is 600 ft. high and is at the end of the peninsula. Fortified by the Turks, it was attacked several times by the British during the fighting in 1915.

**ACHIEVEMENT** (a-chēv'ment). In heraldry, a term applied to the shield of armorial bearings generally, or to a hatchment (q.v.).

**ACHILL** (ak'il). The largest island on the Irish coast, separated from the mainland of Mayo by a narrow sound, now bridged over. The chief occupation is fishing. The island is mountainous, has fine scenery, and is visited by many tourists, there being now a railway terminus here, and many recent improvements. Pop. 6919.

**ACHILLÆ'A.** The milfoil genus of plants.

**ACHILLEION.** Famous castle at Corfu, which used to belong to the Empress Elizabeth of Austria. It was acquired by the ex-Kaiser William II., who bought it from the Archduchess Giséla, wife of Prince Leopold of Bavaria.

**ACHILLES** (a-kil'ēz). A Greek legendary hero, the chief character in Homer's *Iliad*. His father was Peleus, ruler of Phthia in Thessaly, his mother the sea-goddess Thetis. When only six years of age he was able to overcome lions and bears. His guardian, Cheiron the Centaur, having declared that Troy could not be taken without his aid, his mother, fearing for his safety, disguised him as a girl, and introduced him among the daughters of Lycomedes of Scyros. Her desire for his safety made her also try to make him invulnerable when a child by annointing him with ambrosia, and again by dipping him in the River Styx, from which he came out proof against wounds, all but the heel, by which she held him.

His place of concealment was discovered by Odysseus (Ulysses), and he promised his assistance to the Greeks against Troy. Accompanied by his close friend, Patroclus, he joined the expedition with a body of followers (Myrmidons) in fifty ships, and occupied nine years in raids upon the towns neighbouring to Troy, after which the siege proper commenced. On being deprived of his prize, the maiden Briseïs, by Agamemnon, he refused to take any further part in the war, and disaster attended the Greeks.

Patroclus now persuaded Achilles to allow him to lead the Myrmidons to battle dressed in his armour, and he having been slain by Hector, Achilles vowed revenge on the Trojans, and forgot his anger against the Greeks. He attacked the Trojans and drove them back to their walls, slaying them in great numbers, chased Hector, who fled before him three times round the walls of Troy, slew him, and dragged his body at his chariot-wheels, but afterwards gave it up to Priam, who came in person to beg for it. He then performed the funeral rites of Patroclus, with which the *Iliad* closes. He was killed in a battle at the Scæan Gate of Troy by an arrow from the bow of Paris which struck his vulnerable heel. In discussions on the origin of the Homeric poems the term *Achilleid* is often applied to those books (i., viii., and xi.-xxii.) of the *Iliad* in which Achilles is prominent, and which some suppose to have formed the original nucleus of the poem. *See* IPHIGENIA.

**ACHILLES' TENDON, or TENDON OF ACHILLES.** The strong tendon which connects the muscles of the calf with the heel, and which may be easily felt with the hand. The origin of the name will be understood from the above article.

**ACHIMENES** (a-kim'e-nēz). A genus of tropical American plants, with scaly underground tubers, nat. ord. Gesneraceæ, now cultivated in European greenhouses on account of their white, blue, and red flowers.

**ACHLAMYDEOUS** (ak-la-mid'i-us). In botany, wanting the floral envelopes, that is, having neither calyx nor corolla, as the willow.

**ACHOR** (ā'kor). A disease of infants, in which the head, the face, and often the neck and breast become incrusted with thin, yellowish or greenish scabs, arising from minute, whitish pustules, which discharge a viscid fluid.

**ACHROMAT'IC** (Gr. *a*, priv., and *chrōma, chrōmatos*, colour). In optics, transmitting colourless light, that is, not decomposed into the primary colours, though having passed through a refracting medium. A single convex lens does not give an image free from the prismatic colours, because the rays of different

colour making up white light are not equally refrangible, and thus do not all come to a focus together, the violet, for instance, being nearest the lens, the red farthest off. If such a lens of crown-glass, however, is combined with a concave lens of flint-glass—the curvatures of both being properly adjusted—as the two materials have somewhat different optical properties, the latter will neutralise the chromatic aberration of the former, and a satisfactory image will be produced. Telescopes, microscopes, etc., in which the glasses are thus composed are called *achromatic*.

**ACID** (Lat. *acidus*, sour). A name applied to a number of compounds, having more or less the qualities of vinegar (itself a diluted form of acetic acid). Their general properties are sour taste, the power of changing vegetable blues into reds, of evolving hydrogen in presence of magnesium, of decomposing chalk with effervescence, and of being in various degrees neutralised by alkalies. An acid has been defined as a compound of hydrogen, the whole or a part of which is replaceable by a metal when this is presented in the form of a hydroxide; being *monobasic*, *dibasic*, or *tribasic*, according to the number of replaceable hydrogen atoms in a molecule. *See* CHEMISTRY.

**ACIERAGE** (ā'sē-ėr-āj), (Fr. *acier*, steel). A process by which an engraved copper-plate or an electrotype from an engraved plate of steel or copper has a film of iron deposited over its surface by electricity in order to protect the engraving from wear in printing. By this means an electrotype of a fine engraving, which, if printed directly from the copper, would not yield 500 good impressions, can be made to yield 3000 or more; and when the film of iron becomes so worn as to reveal any part of the copper, it may be removed and a fresh coating deposited so that 20,000 good impressions may be got.

**ACIPENSER** (as-i-pen'sėr). The genus of cartilaginous ganoid fishes to which the sturgeon belongs.

**ACI REALE** (ä'chē rā-ä'lā). A seaport of Sicily, north-east of Catania, a well-built town, with a trade in corn, wine, fruit, etc. Pop. 35,587.

**A'CIS.** According to Ovid, a beautiful shepherd of Sicily, loved by Galatea, and crushed to death by his rival the Cyclops Polyphemus. His blood, flowing from beneath the rock which crushed him, was changed into a river bearing his name, and renowned for the coldness of its water. It has been identified as the Fiume di Jaci.

**ACKWORTH.** Town of Yorkshire. It is 4 miles from Pontefract, and is famous for its school. This is chiefly for members of the Society of Friends and there John Bright was educated. It is on the L.N.E. and L.M.S. joint line. Pop. 5315.

**ACLAND.** Famous English family. One of the Aclands was made a baronet in 1645, and this title came to his descendant, Thomas Dyke Acland (1787-1871) as the 10th baronet. Of his sons Thomas Dyke, the 11th baronet, was a Liberal politician; Henry Wentworth Acland, Professor of Medicine at Oxford, was made a baronet in 1890; J. B. Arundel Acland settled in New Zealand, where members of the family still live. Arthur Henry Dyke Acland (1847-1926), a Liberal politician and an authority on education, succeeded his brother as 13th baronet in 1919, and the 14th baronet was his son Francis, also a leading figure in the Liberal party. The Aclands own much land in Devon and Somerset, and their old residence is Holnicote near Taunton. They are buried in Selworthy Church.

**ACLE.** Market town of Norfolk. It is on the Bure, 11 miles from Norwich and 120¼ from London, and is on the L.N.E. Rly. It is a good centre for visitors to the Broads and the church is old and interesting. Pop. 1042.

An Acolyte, wearing his robes of office

**ACLIN'IC LINE** (Gr. priv. *a*, *klinō*, to incline). The magnetic equator, an irregular curve in the neighbourhood of the terrestrial equator, where the magnetic needle balances itself horizontally, having no dip. *See* MAGNETISM.

**ACNE** (ak'nē). A skin disease, consisting of small hard pimples, usually on the face, caused by congestion of the follicles of the skin.

**ACOLYTES** (ak'o-līts). In the ancient Latin and Greek Churches, persons of ecclesiastical rank next in order below the subdeacons, whose office it was to attend the officiating priest. The name is still retained in the Roman Church. Cf. Duchesne, *Christian Worship, its Origin and Evolution*.

**ACOMA.** Indian village in New Mexico. It has the reputation of being the oldest inhabited place in the United States. It is 80 miles from Albuquerque, and is on a rock 6000 ft. above sea level. Here is a large Indian reservation.

**ACONCAGUA** (ä-kon-kä'gwä). A province, a river, and a mountain of Chile. The peak of Aconcagua, whose summit is just within the Argentine Republic, rises to the height of 23,081 feet, and is probably the highest mountain of the western hemisphere. Area of province, 5406 sq. miles. Pop. 480,678.

**AC'ONITE** (*Aconītum*). A genus of hardy herbaceous plants, nat. ord. Ranunculaceæ, represented by the well-known wolf's-bane or monk's-hood, and remarkable for their poisonous properties and medicinal qualities, being used internally as well as externally in rheumatism, gout, neuralgia, etc.

**ACON'ITINE.** An alkaloid extracted from monk's-hood and some other species of aconite; used medicinally, though a virulent poison.

**ACONQUIJA** (ä-kon-kē'hä). A range of mountains in the Argentine Republic; the name also of a single peak, 17,000 feet high.

**A'CORN.** The fruit of the different kinds of oak. The acorn-cups of one species are brought from the Levant under the name of *valonia*, and used in tanning.

**ACORN-SHELL.** *See* BALANUS.

**AC'ORUS.** A genus of plants, including the sweet-flag. *See* SWEET-FLAG and CALAMUS.

**ACOS'TA, Gabriel,** afterwards **Uriel.** A Portuguese of Jewish descent, born at Oporto in 1590, died by his own hand 1640. Brought up a Christian, he afterwards embraced Judaism. Having gone to Amsterdam, where he attacked the practices of the Jews, and denied the divine mission of Moses, he suffered much persecution at the hands of the Jews. He left an autobiography, published in 1687, under the title *Exemplar Humanæ Vitæ*. He is the hero of a novel, *Die Sadducäer von Amsterdam*, and of a tragedy, *Uriel Acosta*, both by Gutzkow.

Acorn

**ACOTYLE'DONS.** Plants not furnished with cotyledons or seed-lobes. They include ferns, mosses, seaweeds, etc., and are also called flowerless plants or cryptogams.

**ACOUSIMETER,** or **ACOUMETER** (Gr. *akouein*, to hear, and *metron*, measure). An instrument used to determine the acuteness of hearing. It consists of a small bar which gives a uniform sound when struck by a hammer.

**ACOUSTICS** (a-kou'stiks). The science of sound. It deals with the production of sound, its propagation and velocity in various media; the reflection, refraction, and interference of sound waves; the properties of musical notes; and the general phenomena of such vibrations of elastic bodies as affect the organ of hearing.

In order that a sound may be heard, it is necessary that an uninterrupted series of particles of elastic matter should extend from the sounding body to our ear. Sound is propagated by a longitudinal wave-

## MUSICAL INTERVALS.—*See* ACOUSTICS.

| Intervals in Perfect Diatonic Scale. | | Perfect Diatonic Scale. | Diatonic Scale on System of Equal Temperament. | Intervals in Tempered Scale —Mean tone. ($2^{\frac{1}{4}} = 1{\cdot}123$). Semitone. ($2^{\frac{1}{12}} = 1{\cdot}059$). |
|---|---|---|---|---|
| | C | 1 | 1·000 | |
| $\frac{9}{8}$ major tone | D | $\frac{9}{8} = 1{\cdot}125$ | $2^{\frac{2}{12}} = 1{\cdot}123$ | tone. |
| $\frac{10}{9}$ minor tone | E | $\frac{5}{4} = 1{\cdot}250$ | $2^{\frac{4}{12}} = 1{\cdot}260$ | tone. |
| $\frac{16}{15}$ limma | F | $\frac{4}{3} = 1{\cdot}333$ | $2^{\frac{5}{12}} = 1{\cdot}335$ | semitone. |
| $\frac{9}{8}$ major tone | G | $\frac{3}{2} = 1{\cdot}500$ | $2^{\frac{7}{12}} = 1{\cdot}498$ | tone. |
| $\frac{10}{9}$ minor tone | A | $\frac{5}{3} = 1{\cdot}667$ | $2^{\frac{9}{12}} = 1{\cdot}682$ | tone. |
| $\frac{9}{8}$ major tone | B | $\frac{15}{8} = 1{\cdot}875$ | $2^{\frac{11}{12}} = 1{\cdot}888$ | tone. |
| $\frac{16}{15}$ limma | C′ | 2 | 2·000 | semitone. |

Major tone ratio = $\frac{9}{8} = 1{\cdot}125$
Minor „ „ = $\frac{10}{9} = 1{\cdot}111$
Mean „ „ = $2^{\frac{2}{12}} = 1{\cdot}123$

Limma tone ratio = $\frac{16}{15} = 1{\cdot}067$
Semitone „ = $2^{\frac{1}{12}} = 1{\cdot}059$

## NOTES OF PERFECT DIATONIC SCALE
(WITH THEIR FREQUENCIES)

| | | | |
|---|---|---|---|
| C″ 64· $Ut_1$ | C, 128· $Ut_2$ | C 256· $Ut_3$ | C′ 512· $Ut_4$ |
| D″ 72 | D, 144 | D 288 | D′ 576 |
| E″ 80 | E, 160 | E 320 | E′ 640 |
| F″ 85·3 | F, 170·7 | F 341·3 | F′ 682·7 |
| G″ 96 | G, 192 | G 384 | G′ 768 |
| A″ 106·6 | A, 213·3 | A 426·7 | A′ 853·2 |
| B″ 120 | B, 240 | B 480 | B′ 960 |
| | | | C″ 1024· $Ut_5$ |

## PERFECT DIATONIC SCALES
(TRANSITION TO KEY OF DOMINANT)

*Example*—Key of C to Key of G

| C | D | E | F | G | A | B | C′ | D′ | E′ | F′ | G′ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | $\frac{9}{8}$ | $\frac{5}{4}$ | $\frac{4}{3}$ | $\frac{3}{2}$ | $\frac{5}{3}$ | $\frac{15}{8}$ | 2 | $\frac{9}{4}$ | $\frac{5}{2}$ | $\frac{8}{3}$ | 3 |

| G | A′ | B | C′ | D′ | E′ | F′♯ | G′ |
|---|---|---|---|---|---|---|---|
| 1 | $\frac{9}{8}$ | $\frac{5}{4}$ | $\frac{4}{3}$ | $\frac{3}{2}$ | $\frac{5}{3}$ | $\frac{15}{8}$ | 2 |

$A = \frac{10}{9}G.$
$A' = \frac{9}{8}G.$
$A' = \frac{81}{80}A.$

$F' = \frac{16}{9}G.$
$F'\sharp = \frac{15}{8}G.$
$= \frac{15}{8} \times \frac{9}{16}F'.$
$= \left(1 + \frac{1}{18\frac{2}{7}}\right)F'.$

motion in the medium (gaseous, liquid, or solid), that is, the particles oscillate along the line in which the wave is travelling, giving rise to regular series of condensations and rarefactions.

The velocity of sound varies directly as the square root of the elasticity, and inversely as the square root of the density, of the medium in which it is propagated. The velocity of sound in air at 0° C. is 330.6 metres per second, or 1085 feet per second; in water 1.49 kilometres per second, or 0.926 mile per second; in copper 5.01 kilometres per second, or 3.12 miles per second.

The intensity of sound varies inversely as the square of the distance from the sounding body. Recently sound-ranging instruments have been produced by means of which the position of a gun can be determined.

A note produced by a musical instrument consists of a *fundamental* of a certain frequency, together with a number of *overtones* of various higher frequencies and much smaller amplitude. The *timbre* of a note depends on the overtones present, the *loudness* depends on the amplitude of the vibrations, and the *pitch* depends on the frequency. The musical scale consists of eight notes, C D E F G A B C, whose frequencies are in the proportion of the numbers 24, 27, 30, 32, 36, 40, 45 and 48. The interval between two notes is the ratio of the frequency of the higher note to the frequency of the lower note. In order that the intervals may be the same in all keys, a tempered scale is used in music.

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**ACQUI** (äk'wē). A town of Northern Italy, 21 miles S.S.W. of Alessandria by rail, a bishop's see. It has warm sulphureous baths, which were known to the Romans, and which still attract a great many visitors. Pop. 16,000.

**ACRE.** A standard British measure of land, also used in the colonies and the United States. The imperial statute acre consists of 4840 sq. yards, divided into 4 roods. The old Scotch acre contains 6146.8 sq. yards, the old Irish acre 7840 sq. yards.

**ACRE** (ā'kẽr), or **AKKA** (ancient **ACCHO** and **PTOLEMAIS**). A seaport of Syria, in Northern Palestine, on the Bay of Acre, early a place of great strength and importance. Taken from the Saracens under Saladin in 1191 by Richard I. of England and Philip of France; bravely defended by the Turks, assisted by Sir Sidney Smith, in 1799 against Napoleon; in 1832, taken by Ibrahim Pasha; in 1840, bombarded by a British, Austrian, and Turkish fleet, and restored to the Sultan of Turkey. The town was occupied by British troops under General Allenby in September, 1918. Pop. 6420.

**ACRI** (ä'krē). A town of S. Italy, province of Cosenza. Pop. 12,686.

**ACRIDINE.** Basic substance found in coal tar in association with crude anthracene. It is used as a dye stuff and also in electric snuff. Its chemical symbol is ($C_{13}H_9N$).

**AC'RITA** (Gr. *akritos*, indistinguishable, doubtful). A name sometimes given to the animals otherwise called Protozoa.

**ACROCEPH'ALI.** Tribes of men distinguished by pyramidal or high skulls.

**ACROCERAU'NIA** (thunder-smitten peaks) (now **CAPE GLOSSA** or **LINGUETTA**). A promontory of Western Greece, in Epirus, running into the Adriatic.

**ACROCORIN'THUS.** A steep rock in Greece, nearly 1900 feet high, overhanging ancient Corinth, and on which stood the acropolis or citadel, the sacred fountain of Pirēnē being also here. This natural fortress has proved itself of importance in the modern history of Greece.

**AC'ROGENS** (-jenz), lit. summit-growers. A term applied to the ferns, mosses, and lichens (cryptogams), as growing by extension upwards, in contradistinction to endogens and exogens.

**AC'ROLITH.** An early form of Greek statuary in which the head, hands, and feet only were of stone, the trunk of the figure being of wood draped or gilded.

**ACROP'OLIS** (Gr. *akros*, high, and *polis*, a city). The citadel or chief place of a Grecian city, usually on an eminence commanding the town. That of Athens contained some of the finest buildings in the world, such as the Parthenon, Erechthēum, etc.

**ACT.** In special senses: (1) In dramatic poetry, one of the principal divisions of a drama, in which a definite and coherent portion of the plot is represented; generally subdivided into smaller portions called *scenes*. The Greek dramas were not divided into acts. The dictum that a drama should consist of five acts

was first formally laid down by Horace, and is generally adhered to by modern dramatists in tragedy. In comedy, especially since the time of Molière, more freedom is allowed, and a division into two or three acts is common.—(2) Something formally done by a legislative or judicial body; a statute or law passed.—(3) In universities, a thesis maintained in public by a candidate for a degree. *See* ACT OF GOD, OF PARLIAMENT, OF SETTLEMENT.

**ACTA DIUR'NA** (Lat., proceedings of the day). A daily Roman newspaper which appeared under both the republic and the empire.

**ACTÆ'A.** *See* BANEBERRY.

**ACTÆ'ON.** In Greek mythology, a great hunter, turned into a stag by Artĕmis (Diana) for looking on her when she was bathing, and torn to pieces by his own dogs.

**ACTA ERUDITO'RUM** (Lat., acts of the learned). The first literary journal that appeared in Germany (1682-1782). It was started by Otto Mencke, after the model of the *Journal des Savants*. Among the contributors, the most distinguished was Leibnitz.

**ACTA SANCTORUM** (Lat., acts of the saints). A name applied to all collections of accounts of ancient martyrs and saints, both of the Greek and Roman Churches, more particularly to the valuable collection begun by John Bolland, a Jesuit of Antwerp, in 1643, and which, being continued by other divines of the same order (*Bollandists*), now extends to sixty volumes, the lives following each other in the order of the calendar.

**ACTING.** Art of representing historic or fictional characters, or scenes. The art of acting is much older than the Greeks, although from them our early ideas of it have come. It was associated with their religious rites and with the dances which were an important part of those ceremonies. At a later time plays were written for the actors to present and, disguised by masks, they declaimed the magnificent dramas of Aeschylus, Sophocles and the other great writers.

Acting flourished, too, among the Romans, one of whom, Roscius, made his name immortal. In the Middle Ages the acting of miracle plays under the leadership of the church was very popular, and then came the Elizabethan Age, which gave to acting, as to everything else, new and greater ideas. At this time and earlier there were no actresses, female parts being taken by men or boys. In England actors were obliged by law to take out a licence, otherwise they were treated as vagabonds, and everywhere they were rather a despised class. They had little or no scenery to help them, as the plays were usually acted at fairs or in the yards of inns. Shakespeare's plays were often acted in this way.

In the 18th century, or perhaps a little earlier, women appeared on the stage, and acting took its modern form. This was partly due to the influence of David Garrick who, with Sarah Siddons, greatly raised the social status of actors and actresses. In the 19th century scenery became much more elaborate, theatres were built almost everywhere and plays were written in thousands. Acting was regarded as a profession with its clubs, organisations and training schools. The twentieth century saw a remarkable development in stagecraft, but no advance in the quality of the acting.

Of modern English actors and actresses perhaps the greatest names are Henry Irving and Ellen Terry, but many others are notable. France and Italy have also had great actors and there, as in Germany, acting has a great hold on the nation. In France, Sara Bernhardt and the elder Coquelin; in Italy Elenora Dusa and Salvini are perhaps the outstanding figures. *See* DRAMA; THEATRE.

**ACTIN'IA.** The genus of animals to which the typical sea-anemones belong. *See* SEA-ANEMONE.

**AC'TINISM.** The property of those rays of light which produce chemical changes, as in photography, in contradistinction to the light rays and heat rays. The actinic property or force begins among the green rays, is strongest in the violet rays, and extends a long way beyond the visible spectrum.

**ACTINIUM.** An element or elementary substance obtained in minute quantities in connection with the study of radioactivity. It was discovered by Debierne in 1899. In 1902 Giesel discovered another substance which he called *emanium*, and which was considered to be identical with *actinium*. Marckwald, however, came to the conclusion that these two substances are not identical but closely related to each other. *See* RADIUM, CHEMISTRY.

**ACTIN'OLITE.** A mineral nearly allied to hornblende.

**ACTINOM'ETER.** An instrument for measuring the intensity of the sun's actinic rays. *See* ACTINISM.

**ACTINOMYCOSIS.** Disease attacking cattle and sometimes men and

women. It develops in the tongue or jaw where it causes a tumour which is sometimes called wooden tongue or lumpy jaw. It is due to a parasite, the "ray fungus," which is sometimes found on barley and makes its way into the animal when it is suffering from a sore. It is infectious.

**ACTINOZO'A** (lit. ray-animals). A class of animals belonging to the sub-kingdom Cœlenterata, and including sea-anemones, corals, etc., all having rayed tentacles round the mouth.

**ACTION.** The mode of seeking redress at law for any wrong, injury, or deprivation. Actions are divided into civil and criminal, the former again being divided into real, personal, and mixed.

**AC'TIUM** (now **LA PUNTA**). A promontory on the western coast of Northern Greece, not far from the entrance of the Ambracian Gulf (Gulf of Arta), memorable on account of the naval victory gained here by Octavianus (afterwards the Emperor Augustus) over Antony and Cleopatra, 2nd Sept., 31 B.C., in sight of their armies encamped on the opposite shores of the Ambracian Gulf. Soon after the beginning of the battle Cleopatra escaped with sixty Egyptian ships, and Antony basely followed her, and fled with her to Egypt. The deserted fleet was not overcome without making a brave resistance. Antony's land forces soon went over to the enemy, and the Roman world fell to Octavianus. In 1538 a victory was gained at Actium by the Turks over the Spanish and Venetian fleets.

**ACT OF PARLIAMENT.** A law or statute proceeding from the Parliament of the United Kingdom passed in both houses, and having received the royal assent. Before it is passed it is a *Bill* and not an Act. Acts are either public or private, the former affecting the whole community, the latter only special persons and private concerns. The whole body of public Acts constitutes the *statute law*. An Act of Parliament can only be altered or repealed by the authority of Parliament. Acts are usually cited in this way, "13 and 14 Vict. c. (or chap.) 21," which means the 21st Act in succession passed in year 13th-14th of the queen's reign (that is, 1850). Short titles, such as "the Merchant Shipping Act, 1854," are also used. Up to the time of Edward I. acts of Parliament were in Latin; then French was introduced, and for some time was exclusively employed. It was not till Henry VII.'s reign that all Acts were in English.

**ACT OF SETTLEMENT.** An Act passed by the English Parliament in 1700, by which the succession to the throne of the three kingdoms, in the event of King William and Princess (afterwards Queen) Anne dying without issue, was settled on the Princess Sophia, electress of Hanover, and the heirs of her body, being Protestants. The Princess Sophia was the youngest daughter of Elizabeth, Queen of Bohemia, daughter of James I. By this act George I., son of the Princess Sophia, succeeded to the crown on the death of Queen Anne.

Another Act of Settlement was that by which under Cromwell's government, a new allotment was made of almost all landed property in Ireland, in 1652.

**ACT OF UNIFORMITY.** An English Act passed in 1662, enjoining upon all ministers to use the *Book of Common Prayer* on pain of forfeiture of their livings. *See* NONCONFORMITY.

**ACTON.** A kind of padded or quilted vest or tunic formerly worn under a coat of mail to save the body from bruises, or used by itself as a defensive garment. Jackets of leather or other material plated with mail were also so called. *Gambeson* was an equivalent term.

Fifteenth century quilted Acton

**ACTON.** A name of various places in England, one of them a western suburb of London, pop. (1931), 70,523. Since 1918 Acton gives its name to a parliamentary division of Middlesex, returning one member to Parliament.

**ACTON, John Emerich Edward Dalberg.** First Baron Acton, born 1834, died 1902, was son of Richard Acton (seventh baronet) and the daughter of the Duc de Dalberg, afterwards wife of Earl Granville, Mr. Gladstone's colleague. As a

Roman Catholic he was educated at Oscott, and afterwards on the Continent, partly under Döllinger, and acquired a special taste for and profound knowledge of history.

He conducted the *Home and Foreign Review* from 1862 to 1864, and, in doing so, showed himself a strong opponent of ultramontane pretensions. He next edited the *North British Review*, which under him was rather overweighted with learning, and soon came to an end. In 1869 he was raised to the peerage. He strongly opposed the papal-infallibility movement, and took the side of Mr. Gladstone in his attacks on Vaticanism.

In 1895 he accepted the professorship of modern history at Cambridge, delivered lectures, and planned and undertook the editorship of the great work on modern history, *The Cambridge Modern History*, comprising a series of contributions by various scholars, and issued by the university press. Except essays, letters, or articles for periodicals, he himself wrote little. Since his death have been published: *Lectures in Modern History* (1906); *The History of Freedom and other Essays* (1907); *Lectures on the French Revolution* (1910). His library of 60,000 volumes he left to Mr. (afterwards Lord) Morley, who handed it over to the University of Cambridge.

**ACTOR.** One who represents some part or character on the stage. Actresses were unknown to the Greeks and Romans in the earliest times, men or boys always performing the female parts. They appeared under the Roman empire, however. Charles II. first encouraged the public appearance of actresses in England; in Shakespeare's time there were none. *See* DRAMA.—BIBLIOGRAPHY: C. F. Armstrong, *Century of Great Actors*; H. Simpson, *Century of Great Actresses*.

**ACTS OF THE APOSTLES.** Fifth of the books of the New Testament, written in Greek and assigned to the author of the gospel of St. Luke. Its date is probably A.D. 63 or 64. It embraces a period of about thirty years, beginning immediately after the resurrection, and extending to the second year of the imprisonment of St. Paul in Rome. Very little information is given regarding any of the apostles, excepting St. Peter and St. Paul, and the accounts of them are far from being complete. It describes the gathering of the infant Church; the fulfilment of the promise of Christ to his apostles in the descent of the Holy Ghost; the choice of Matthias in the place of Judas, the betrayer; the testimony of the apostles to the resurrection of Jesus in their discourses; their preaching in Jerusalem and in Judea, and afterwards to the Gentiles; the conversion of Paul, his preaching in Asia Minor, Greece, and Italy, his miracles and labours.—BIBLIOGRAPHY: R. T. Knowling, *The Expositor's Greek Testament*; J. Moffat, *The Historical New Testament*; J. M. Wilson, *Origin and Aim of the Acts of the Apostles*.

**ACTUARY.** One who works out numerical calculations. These deal largely with averages and insurance charges.

Actuaries are employed by the big Insurance Companies, and also by the Government for Health Insurance and other purposes. The profession is under the control of the Institute of Actuaries in England and the Faculty of Actuaries in Scotland, the qualifying examinations of the societies entitling the successful candidate to the letters F.I.A. and F.F.A. respectively. Particulars of training and fees can be obtained from the Institute of Actuaries, Staple Inn Hall, Holborn, London, W.C.1, or the Faculty of Actuaries, 14 Queen Street, Edinburgh.

The Fellowship of the Institute of Actuaries or of the Faculty of Actuaries does not of itself entitle the holder to increased remuneration, as in most businesses payment is made for the class of work done rather than for the qualifications held. As a rule, however, an Actuary is of great use in various departments of insurance, and even if he does not obtain an official position he will hold a position of some responsibility.

As regards remuneration the salary of an Actuary, when he is the principal officer of a company, is usually between £1500 and £5000, but may, of course, be considerably more in the very largest companies.

**ACU'LEUS.** In botany, a prickle, or sharp-pointed process of the epidermis, as distinguished from a thorn or spine, which is of a woody nature.

**ACUPRESS'URE.** A means of arresting bleeding from a cut artery introduced by Sir James Simpson in 1859, and consisting in compressing the artery above the orifice, that is, on the side nearest the heart, with the middle of a needle (Lat. *acus*, a needle) introduced through the tissues.

**ACUPUNC'TURE.** A surgical operation, consisting in the insertion of needles into certain parts of the

body for alleviating pain, or for the cure of different species of rheumatism, neuralgia, eye diseases, etc. It is easily performed, gives little pain, causes neither bleeding nor inflammation, and seems at times of surprising efficacy.

**ADAGIO** (It. à-dā'jō). A musical term, expressing a slow time, slower than *andante* and less so than *largo*, *lento*, and *grave*.

**ADÂL'**. A country in Africa, east of Abyssinia and north-westward of Tajurrah Bay, inhabited by a dark-brown race of the same name, a tribe of the Danakils, Mahommedans in religion; towns Aussa and Tajurrah. Part of the coast here is held by the French.

**AD'ALBERT OF PRAGUE.** Called the apostle of the Prussians, son of a Bohemian nobleman named Slavnik, born about 939. His real name was Voitech, but he assumed the name of the Archbishop Adalbert, under whom he studied at Magdeburg. He was appointed Bishop of Prague in 983, laboured in vain among the heathenish Bohemians, resolved to convert the pagans of Prussia, but was murdered in the attempt (997). *Boga-Rodzica*, a Polish war-song, is said to have been composed by him.

**ADA'LIA.** A seaport on the south coast of Asia Minor. Pop. 12,310. The district of Adalia has a population of over 224,737.

**ADAM** (à-dàn), **Adolphe Charles.** A French composer, more especially of comic operas; born 1803, died 1856. Wrote *Le postillon de Longjumeau*, *Le Brasseur de Preston* (Brewer of Preston), *La Rose de Peronne*, *Le roi d'Yvetot*, etc.

**ADAM, Albrecht.** A German painter of battles and animals, born 1786, died 1862. Three sons of his have also distinguished themselves as painters, especially Franz, born 1815, died 1886, among whose best pictures are several representing scenes of the Franco-Prussian war.

**ADAM, Alexander.** A Scottish classical scholar, born in 1741; became in 1768 rector of the High School of Edinburgh, and died there in 1809. Wrote *Principles of Latin and English Grammar*; *Roman Antiquities*, a useful school-book; *Summary of Geography and History*; *Classical Biography*. etc.

**ADAM, Robert.** An eminent Scottish architect, born in 1728, a son of William Adam, architect. He resided several years in Italy, visited Spalatro, in Dalmatia, and published a work on the ruined palace of Diocletian there. In conjunction with his brother James he was much employed by the English nobility and gentry in constructing modern and embellishing ancient mansions. Among their works are the Register House and the University Buildings, Edinburgh, and the Adelphi Buildings, London. The brothers Adam also designed furniture and excelled in the beauty of their interior decorations. They were especially

Adam Period

happy in ceilings and fireplaces, and many examples of these are still to be seen in various parts of the country. Their work is distinguished by its purity of line and the lightness and delicacy of its ornament. Robert Adam died in 1792 and was buried in Westminster Abbey; his brother James died in 1794.

**ADAM AND EVE.** The names given in Scripture to our first parents, an account of whom and their immediate descendants is given in the early chapters of Genesis. Cain, Abel, and Seth are all their sons that are mentioned by name; but we are told that they had other sons as well as daughters. There are numerous Rabbinical additions to the Scripture narrative of an extravagant character, such as the myth of Adam having a wife before Eve, named *Lilith*, who became the mother of giants and evil spirits.

Other legends or inventions are contained in the Koran.

**ADAM DE LA HALE.** An early French writer and musician, born 1235, died 1287. His *Jeu de Robin et de Marion* (first produced at Naples), may be regarded as the first comic opera ever written. Cf. H. Guy, *Bibliographie Critique du Trouvère*, Paris, 1900.

**AD'AMANT.** An old name for the diamond; also used in a vague way to imply a substance of impenetrable hardness.

**ADAMAN'TINE SPAR.** A name of the mineral corundum or of a brownish variety of it.

**ADAMA'WA** (also called **FUMBINA**). A region of West Africa, between lat. 6° and 10° N., and lon. 11° and 17° E. Much of the surface is hilly or mountainous, Mount Atlantika being 6000 feet. The principal river is the Benue. A great part of the country is covered with thick forests. The oil palm and bananas are staple products. Chief town Yola (Nigeria).

**ADAMELLO.** *See* EUROPEAN WAR.

**AD'AMITES.** A religious sect dating from the second century, probably of Gnostic origin. It was so called because both men and women were said to appear naked in their assemblies, either to imitate Adam in the state of innocence or to prove the control which they possessed over their passions. Practices similar to those of the Adamites arose several times in later ages. *See* BEGHARDS.

**ADAM'NAN, St.** Born in Ireland about 624, was elected abbot of Iona in 679, and died there about 703 or 704. He is best known from his *Life of St. Columba*, valuable as throwing light on the early ecclesiastical history of Scotland. (There are editions by Reeves, 1857; reissued with English translation 1874; and by Fowler, 1895). His feast is is celebrated on 23rd Sept.

**ADAMS, Charles Francis.** American litterateur and statesman, was a son of John Quincy Adams, and was born in 1807. His boyhood was spent in Europe, partly in England; but he finished his education at Harvard, and afterwards studied law. After serving some years in the Massachusetts legislature he was sent to Congress in 1859. In 1861 Lincoln sent him to England as American minister, and here he remained for seven years, performing the arduous duties of his office with the utmost tact and ability. Between 1874 and 1877 he edited a complete edition of his grandfather's works in 12 vols. He was one of the arbitrators on the *Alabama* claims. Died in 1886.

**ADAMS, John.** Second president of the United States, was born at Braintree (now Quincy), Massachusetts, 19th Oct., 1735. He was educated at Harvard University, and adopted the law as a profession. His attention was directed to politics by the question as to the right of the English Parliament to tax the colonies, and in 1765 he published some essays strongly opposed to the claims of the mother country. As a member of the new American congress in 1774, 1775, and 1776 he was strenuous in his opposition to the home Government, and in organising the various departments of the colonial Government. On 13th May, 1776, he seconded the motion for a declaration of independence proposed by Lee of Virginia, and was appointed a member of committee to draw it up. The declaration was actually drawn up by Jefferson, but it was Adams who fought it through Congress.

In 1778 he went to France on a special mission, but soon came back and again returned, and for nine years resided abroad as representative of his country in France, Holland, and England. After taking part in the peace negotiations he was appointed, in 1785, the first ambassador of the United States to the Court of St. James. He was recalled in 1788, and the following year elected vice-president of the republic under Washington. In 1792 he was re-elected vice-president, and at the following election in 1797 he became president in succession to Washington.

The commonwealth was then divided into two parties, the Federalists, who favoured aristocratic and were suspected of monarchic views, and the Republicans. Adams adhered to the former party, with which his views of government had always been in accordance, but the real leader of the party was Hamilton, with whom Adams did not agree, and who tried to prevent his election. His term of office proved a stormy one, which broke up and dissolved the Federalist party. His re-election in 1801 was again opposed by the efforts of Hamilton, which ended in effecting the return of the Republican candidate Jefferson.

Thus it happened that when Adams retired from office his influence and popularity with both parties were at an end, and he sunk at once into the obscurity of private life. He had the consolation, however, of living to see his son president.

He died 4th July, 1826, the fiftieth anniversary of the declaration of independence, and on the same day as Jefferson. His works have been ably edited by his grandson Charles Francis Adams.

**ADAMS, John Couch.** English astronomer, born 1819, died 1892, studied at Cambridge and was senior wrangler in 1843. His investigations into the irregularities in the motion of the planet Uranus led him to the conclusion that they must be caused by another more distant planet, and the results of his labours were communicated in September and October, 1845, to Professor Challis and Airy the Astronomer Royal.

The French astronomer Leverrier had by this time been engaged in the same line of research, and had come to substantially the same results, which, being published in 1846, led to the actual discovery of the planet Neptune by Galle of Berlin. In 1858 Adams was professor of mathematics at Aberdeen University, and in 1859 was appointed Lowndean professor of astronomy and geometry at Cambridge.

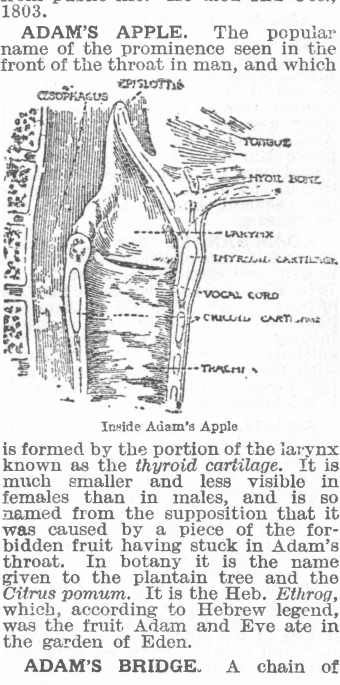
**ADAMS, John Quincy.** Sixth president of the United States, son of John Adams, second president, was born 11th July, 1767. Accompanying his father to Europe he received part of his education there but graduated at Harvard in 1788. Having adopted the legal profession, in 1791 he was admitted to the bar. He now began to take an active interest in politics, and some letters that he wrote having attracted general attention, in 1794 Washington appointed him minister to the Hague. He afterwards was sent to Berlin, and also on a mission to Sweden. In 1798 he received a commission to negotiate a treaty of commerce with Sweden. On the accession of Jefferson to the presidency in 1801 he was recalled.

The Federalist party (that of his father), which was now declining had sufficient influence in Massachusetts to elect him to the senate in 1803. On an important question of foreign policy, that of embargo, he abandoned his party, and having lost his re-election on this account, he retired to the professorship of rhetoric at Cambridge, which he held from 1806 to 1809.

In 1809 he went as ambassador to Russia. He assisted in negotiating the peace of 1814 with England, and was afterwards appointed resident minister at London. Under Monroe as president he was secretary of state, and at the expiration of Monroe's double term of office he succeeded him in the presidency (1825). He was not very successful as president, and at the end of his term (1829) he was not re-elected. In 1831 he was returned to Congress by Massachusetts, and continued to represent this State till his death, his efforts being now chiefly on behalf of the Abolitionist party. He died 21st Feb., 1848.

**ADAMS, Samuel.** An American statesman, second cousin of President John Adams, was born in Boston, 27th Sept., 1722, and was educated at Harvard College. He early devoted himself to politics, and in connection with the dispute between America and the mother country he showed himself one of the most unwearied, efficient, and disinterested assertors of American freedom and independence. He was one of the signers of the declaration of 1776, which he laboured most indefatigably to bring forward. He sat in congress eight years; from 1789-94 was lieutenant-governor of Massachusetts; from 1794-7 governor, when he retired from public life. He died 2nd Oct., 1803.

**ADAM'S APPLE.** The popular name of the prominence seen in the front of the throat in man, and which




Inside Adam's Apple

is formed by the portion of the larynx known as the *thyroid cartilage*. It is much smaller and less visible in females than in males, and is so named from the supposition that it was caused by a piece of the forbidden fruit having stuck in Adam's throat. In botany it is the name given to the plantain tree and the *Citrus pomum*. It is the Heb. *Ethrog*, which, according to Hebrew legend, was the fruit Adam and Eve ate in the garden of Eden.

**ADAM'S BRIDGE.** A chain of

reefs, sandbanks, and islands stretching between India and Ceylon: so called because the Mohammedans believe that when Adam was driven from paradise he had to pass by this way to Ceylon (where is also Adam's Peak). The Brahmans call it the bridge of Rama, the hero of the Indian Epic, the *Ramayana*.

**ADAM'S NEEDLE.** A popular name of the Yucca plant.

**ADAM'S PEAK.** One of the highest mountains in Ceylon, 45 miles east-south-east of Colombo, conical, isolated, and 7352 feet high. On the top, a rocky area of 74 feet by 24, is a hollow in the rock 5 feet long bearing a rude resemblance to a human foot, which the Brahmans believe to be the footprint of Siva; the Buddhists, who call it Sri-pada (sacred footmark), that of Buddha; the Mahommedans that of Adam. The last-named believe that Adam stood here on one foot for a thousand years, lamenting his exclusion from Eden. Devotees of all creeds meet here and present their offerings (chiefly rhododendron flowers) to the sacred footprint. The ascent is very steep, and towards the summit is assisted by steps cut and iron chains riveted in the rock.

**ADAMSON, William.** Scottish politician. Born in 1863, he worked as a miner in Fifeshire until 1902, when he became secretary of a trade union. 1908 he was made general secretary of the Scottish miners, and in 1910 was elected M.P. for West Fifeshire. In 1917 he was chairman of the Labour Party, and in 1924 became Secretary for Scotland in the first Labour Government. He held the same post in the second Labour Government, 1929-31, but in Oct. lost his seat in Parliament.

**AD'ANA.** Town and capital of Adana vilayet, Asia Minor, on the Seihun-Irmak; served by the Bagdad Railway. The district is claimed by Armenia. Cotton, rice, wine, and fruit are exported. Pop. (town), 72,577; (vilayet), 137,915.

**ADANSO'NIA.** *See* BAOBAB.

**ADAPTATION** (from the Lat. *ad*, to, and *aptāre*, to fit). The process of modification or alteration of a thing so as to change its original purpose and adapt it to other uses. Adaptation in biology is the power and process by which an organism or species of animals or plants changes and becomes modified, so as to suit the conditions of its life. In other words it is the adjustment, or favourable reaction, of the living world to its environment, the advantageous variation of animals and plants under changed conditions. The term now includes both that which is hereditary and that which is acquired. The powers of lower forms of life to adapt themselves to changes of environment are limited, and frequently, when the conditions vary suddenly, they are either arrested in their development or die altogether.

In literature it is the process by which an author modifies the work of another not in its essence but in its form and details, either in the original or in a foreign language.

**A'DAR.** The twelfth month of the Hebrew sacred and sixth of the civil year, answering to part of February and part of March.

**ADDA** (ancient **ADDUA**). A river of North Italy, which, descending from the Rhætian Alps, falls into Lake Como, and leaving this joins the Po, after a course of about 170 miles. On the banks of the Adda Napoleon won the battle of Lodi in 1796.

**ADDA.** A species of lizard, more commonly called Skink.

**AD'DAX.** A species of antelope (*Hippotrāgus nasomaculātus*) of the size of a large ass, with much of its make. The horns of the male are about 4 feet long, beautifully twisted into a wide-sweeping spiral of two turns and a half, with the points directed outwards. It has tufts of hair on the forehead and throat, and large broad hoofs. It inhabits the sandy regions of Nubia and Kordofan, and is also found in Caffraria.

**ADDER.** A name often applied to the common viper as well as to other kinds of venomous serpents. *See* VIPER.

Adder (*Vipera communis*)

**ADDER-PIKE** (*Trachīnus vipĕra*). A small species of the weever fish, called also the Lesser Weever or Sting-fish. *See* WEEVER.

**ADDER-STONE.** The name given in different parts of Britain to certain rounded perforated stones or glass beads found occasionally, and supposed to have a kind of supernatural efficacy in curing the bites of adders. They are believed to have been anciently used as spindle-whorls, that is, a kind of small fly-wheel to keep up the rotatory motion of the spindle.

**ADDER'S-TONGUE.** A species of British fern (*Ophioglossum vulgātum*), whose spores are produced on a spike, supposed to resemble a serpent's tongue.

**ADDER'S-WORT.** A name of snakeweed or bistort (*Polygŏnum Bistorta*), from its supposed virtue in curing the bite of serpents.

**ADDINGTON.** District of Croydon. There was a palace, once a residence of the Archbishops of Canterbury. It was built in 1772, probably on the site of the manor house of the village, and in 1808 was bought for the archbishop. In 1902 it was sold and it is now a country club with a golf course attached.

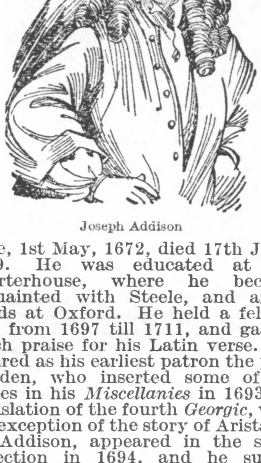
**AD'DINGTON, Henry.** Viscount Sidmouth, born 1757, died 1844. Entered Parliament, 1783, as a warm supporter of Pitt. Was elected speaker of the House of Commons, 1789, and in 1801 invited by the king to form an administration, chiefly signalised by the conclusion of the Peace of Amiens. Quarrelled with Pitt, whom he bitterly attacked. Was home secretary from 1812 till 1822, his repressive policy making him remarkably unpopular with the nation at large. Retired from official life in 1824.

**ADDIS ABA'BA,** or **ADDIS ABEDA.** A town in the south of Abyssinia, in Shoa, ranking as capital of the country, being chief residence of the negus or sovereign. It stands among mountains, at the height of 10,000 feet, and is a primitive place, but now has telegraphic connection with Jibouti and Massawa, and since 1917 is the terminus of the railway running inland from Jibouti by way of Harar. Pop. 65,000.

**ADDISCOMBE.** Suburb of Croydon. It is notable because from 1812 to 1861 the East India Company had a college here for training officers for its army. This has now been pulled down and the district is covered with houses. It stands on the S. Rly. *See* CROYDON.

**AD'DISON, Rt. Hon. Christopher, P.C., M.D.** Cabinet Minister. Dr. Addison was born 19th June, 1869, and educated at Trinity College, Harrogate, and St. Bartholomew's Hospital, London, where he was a lecturer for a time. He was elected Member of Parliament for the Hoxton Division, Shoreditch, in 1910, and was parliamentary secretary to the Board of Education from 1914 to 1915. From 1916 to 1917 he was Minister of Munitions; he was President of the Local Government Board from January to June, 1919, when he became Minister of Health. Having put forward a housing scheme, he left office in 1921, lost his seat in Parliament, and broke away from Lloyd George. He then joined the Labour Party and in 1929 was elected M.P. for the Swindon Division. In the Labour Ministry he was made secretary to the Ministry of Agriculture in 1929 and became head of the department in 1931. In Aug. he resigned office and in the following Oct. lost his seat in Parliament. He has written and edited several works on medical subjects.

**AD'DISON, Joseph.** An eminent English essayist, son of the Rev. Lancelot Addison, afterwards Dean of Lichfield, born at Milston, Wilt-



Joseph Addison

shire, 1st May, 1672, died 17th June, 1719. He was educated at the Charterhouse, where he became acquainted with Steele, and afterwards at Oxford. He held a fellowship from 1697 till 1711, and gained much praise for his Latin verse. He secured as his earliest patron the poet Dryden, who inserted some of his verses in his *Miscellanies* in 1693. A translation of the fourth *Georgic*, with the exception of the story of Aristæus, by Addison, appeared in the same collection in 1694, and he subsequently translated for it two and a half books of Ovid. Dryden also prefixed his prose essay on Virgil's *Georgics* to his own translation of that poem, which appeared in 1697.

An early patron of his was Charles Montague, afterwards Earl of Halifax; another was Lord Somers, who procured him a pension of £300 a year to enable him to qualify for diplomatic employments by foreign travels. He spent from the autumn of 1699 to that of 1703 on the Continent, where he became acquainted with Malebranche, Boileau, etc. During his residence abroad his tragedy of *Cato* is supposed

to have been written. During his journey across Mont Cenis he wrote his *Letter from Italy*, esteemed the best of his poems, and in Germany his *Dialogues on Medals*, which was not published till after his death. His *Remarks on Several Parts of Italy in the Years* 1701-3 was published in 1705.

His political friends lost power on the death of William III., but *The Campaign*, a poem on the battle of Blenheim, procured him an appointment as a commissioner of appeal on excise. In 1706 he received an under-secretaryship, in 1707 accompanied Halifax on a mission to Hanover, in 1709 became secretary to the Viceroy of Ireland, and keeper of the records. In 1708 he was elected Member of Parliament for Lostwithiel, a seat he exchanged in 1710 for Malmesbury, which place he continued to represent till his death.

From Oct., 1709, to Jan., 1711, he contributed 75 papers to the *Tatler*, either wholly by himself or in conjunction with Steele, thus founding the new literary school of the Essayists. For the *Spectator* (2nd Jan., 1711, to 6th Dec., 1712) he wrote 274 papers, all signed by one of the four letters C., L., I., O. His tragedy of *Cato*, produced April, 1713, ran for twenty nights, and was translated into French, Italian, German, and Latin. His other contributions to periodicals included 51 papers to the *Guardian* (May to Sept., 1713), 24 papers to a revived *Spectator* conducted by Budgell, and 2 papers to Steele's *Lover*. On the death of Queen Anne he successively became secretary to the lords justices, secretary to the Irish viceroy, and one of the lords commissioners of trade. He published the *Freeholder* (23rd Dec., 1715, to 9th June, 1716), a political *Spectator*.

In August, 1716, he married the Countess of Warwick, a marriage which did not increase his happiness. He retired from public life, March, 1718, with a pension of £1500 a year. He formed a close friendship with Swift, and was chief of a distinguished literary circle. He had literary quarrels with Pope and Gay, the former of whom in revenge wrote the satire contained in his lines on Atticus in the *Epistle to Dr. Arbuthnot*. He also had a paltry quarrel over politics with his old friend Steele. His death took place at Holland House, its cause being dropsy and asthma. He was buried in Westminster Abbey.

Of his style as a writer so much has been said that nothing remains to say but to quote the dictum of Johnson: 'Whoever wishes to attain an English style, familiar but not coarse, and elegant but not ostentatious, must give his days and nights to the volumes of Addison." He had great conversational powers, and his intimates speak in the strongest terms of the enjoyment derived from his society, but he was extremely reserved before strangers. His *Dialogues on Medals* and *Evidences of the Christian Religion* were published posthumously in Tickell's collected edition of his works.—BIBLIOGRAPHY: W. J. Courthope, *Addison* (English Men of Letters Series); *Essays from the Spectator*, edited by Henry Morley.

**ADDISON'S DISEASE** (from Dr. Addison, Guy's Hospital, London, who traced the disease to its source). A fatal disease, the seat of which is the two glandular bodies placed one at the front of the upper part of each kidney, and called *suprarenal capsules*. It is characterised by anæmia or bloodlessness, extreme prostration, and the brownish or olive-green colour of the skin. Death usually results from weakness, and commonly takes place within a year.

**ADDLED PARLIAMENT.** A parliament called 5th April, 1614, in order to legalise the customs duties imposed by James I., but which, proceeding to the redress of grievances instead of granting supply, was dissolved, 7th June, without passing a single Bill.

**ADDLESTONE.** Town of Surrey. It is 19¾ miles from London and is reached by the S. Rly. Its industries include motor-car, printing and leather dressing works. It is in the parish of Chertsey and a suburb of Weybridge. Pop. 8098.

**ADDRESS, Forms of.** The following are the principal modes of formally addressing titled personages, or persons holding official rank in Great Britain:—

*The King or Queen.*—Address in writing: To the King's (Queen's) most excellent Majesty. Say: Sire or Madam, Your Majesty.

*The Royal Family.*—His Royal Highness (H.R.H.) the Prince of Wales, His Royal Highness the Duke of C—, His Royal Highness Prince A—. A royal duke should be addressed as Sir, not My Lord Duke; and referred to as Your Royal Highness. A princess is addressed Her Royal Highness the Duchess of ——, Her Royal Highness Princess A—; and personally as Madam, Your Royal Highness.

*Duke and Ducal Family.*—His Grace the Duke of ——; My Lord Duke, Your Grace. Her Grace the Duchess of ——; Madam, Your Grace. The duke's eldest son is in law only an esquire, but in courtesy takes a secondary title of his father, and is addressed as if he held it by right. A younger son is addressed Lord J— B—; My Lord, Your Lordship; a daughter, Lady M— B— (Christian and surname); Madam, Your Ladyship. A duke's marquis's, or earl's daughter marrying a commoner simply changes her surname for his.

*The Lord-lieutenant of Ireland* is styled His Excellency, or, if a duke, His Grace, and addressed according to his titular rank.

*Marquess.*—The Most Honourable the Marquess of ——: My Lord Marquess, My Lord. The eldest son has a secondary title of his father, as in the

case of a duke's eldest son; the younger sons and the daughters are all addressed as the younger sons and daughters of a duke.

*Earl.*—The Right Honourable the Earl of ——; My Lord, Your Lordship. The Right Honourable the Countess of ——; Madam, Your Ladyship. The eldest son is addressed by a secondary title of his father; younger son, The Honourable G— T—; Sir, the daughter, as duke's and marquess's daughter.

*Viscount.*—The Right Honourable the Viscount ——; My Lord, Your Lordship. The Right Honourable the Viscountess ——; Madam, Your Ladyship. Son: The Honourable A— B— (Christian and surname); Sir. Daughter: The Honourable J— C— (Christian and surname); Madame; if married, the Honourable Mrs. —— (married name).

*Baron.*—The Right Honourable Lord ——; My Lord, Your Lordship. The Right Honourable the Lady ——; Madam, Your Ladyship. Son: The Honourable J— C—; Sir. Daughter: The Honourable M— H—; if married, The Honourable Mrs. ——, same as viscount's daughter.

*Baronet.*—Sir A— B—, Baronet; Sir; more familiarly Dear Sir A——.

*Knight.*—Sir C— D—, Kt., or K.C.S.I., K.C.B., G.C.B., etc., according to rank. The wives of baronets and knights are styled Lady, Lady——.

*Archbishop.*—His Grace the Lord Archbishop of ——; My Lord Archbishop; Your Grace. An archbishop is also styled Most Reverend.

*Bishop.*—The Right Rev. the Lord Bishop of ——; My Lord. The wives of prelates have no special title. Bishops not connected with the English established church may be addressed—The Right Reverend Bishop ——; Right Reverend Sir.

*Dean.*—The Very Reverend; Sir; Mr. Dean.

Members of the Privy Council, members and ex-members of cabinet, the Speaker of the House of Commons, the Lord Chancellor, the Lord Chief Justice and the Lords Justices, the Lord Advocate, the lords of the treasury and admiralty, are called Right Honourable; the justices (not being *lords* justices) are styled Honourable. Ambassadors, governors of colonies, etc., are styled Excellency.

The Lord Mayors of London, York, Dublin, etc., and the Lord Provost of Edinburgh, are styled Right Honourable; the Lord Provost of Glasgow, Honourable. A Mayor is addressed as Right Worshipful. Lords of Session (Scotland) have the courtesy title of Lord, are addressed as My Lord, Your Lordship, and also called Honourable. Sheriffs and their substitutes are addressed in their courts in Scotland as My Lord.

In the United States persons holding official rank are similarly addressed; thus the President is styled His Excellency, as are also governors of states and foreign ministers; the vice-president, lieutenant-governors, senators, representatives, judges, and mayors are styled Honourable.

**ADDRESSOGRAPH.** Machine used for addressing envelopes, wrappers, etc. Each address is engraved on a plate. The plates are fed into the machine one by one and after the addresses have been printed are returned to their drawers.

**ADDUC'TOR.** A muscle which draws one part of the body towards another; applied in zoology to one of the muscles which bring together the valves of the shell of the bivalve molluscs.

**ADEL'.** *See* ADAL.

**ADELA.** Born 1062, died 1137, fourth daughter of William the Conqueror, wife of Stephen, Count of Blois and Chartres, and mother of Stephen, King of England. She proved herself an able ruler and a generous patroness of learning while her husband was abroad with the First Crusade; and after his death she acted as regent for his sons.

**ADELAIDE** (ad'e-lād). The capital of South Australia, 7 miles east by rail from Port Adelaide (on St. Vincent Gulf), its port, with which it is united by railway, founded in 1837, and named after the queen of William IV. Situated on a large plain, it is built nearly in the form of a square, with the streets at right angles, and is divided into North and South Adelaide, separated by the river Torrens, which is crossed by several bridges, and by means of a dam is converted into a fine sheet of water. The public buildings comprise the Government House, the town hall, the post and telegraph offices, the Government offices, court-houses, the houses of legislature, the University, South Australian Institute, etc. There is a good service of tramway cars. Adelaide is connected by railway with Melbourne, and is the terminus of the overland telegraph to Port Darwin. It has a large trade. Pop. (including suburbs), 324,420.

**ADELAIDE.** Daughter of George, Duke of Saxe-Coburg-Meiningen, and wife of the Duke of Clarence, afterwards William IV., King of England; born 1792, died 1849; married 11th July, 1818, had two daughters, who died in infancy. She became queen-consort on William attaining the throne in 1830, and was for a time unpopular from being supposed to be averse to reform. On the death of William she passed into private life, with an allowance of £100,000 a year.

**ADELARD OF BATH.** An English philosophical writer of the twelfth century. He travelled through Spain, the north of Africa, Greece, and Asia Minor, and acquired from the Arabs much knowledge, which he put in systematic shape. Chief works, *Perdifficiles Quæstiones Naturales* and *De Eodem et Diverso*.

**ADELBODEN.** Health and pleasure resort in Switzerland. It is in the canton of Berne, over 4000 feet high, and is beautifully placed amid the mountains. The mineral springs are good for certain complaints, and winter sports are held here.

**ADELPHI.** District in London. It was laid out by Robert Adam and his brothers and is named from *adelphos*, the Greek for brother. It is between the Strand and the Thames, and its chief buildings, those on Adelphi Terrace, overlook the river. The Adelphi Theatre is in the Strand, just outside the Adelphi proper.

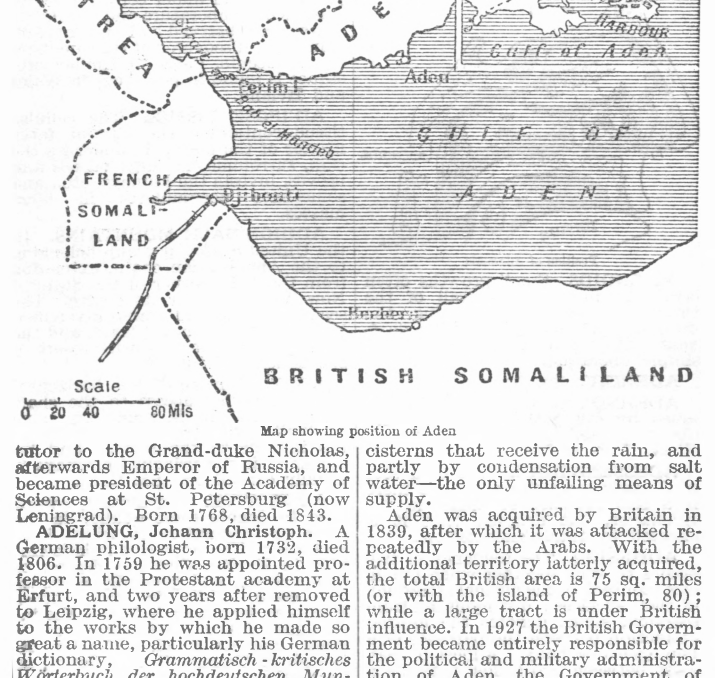
**ADELSBERG** (ā'dèlz-berh). A small

town of North Italy, in Carniola, midway between Trieste and Laibach, remarkable for the wonderful stalactite cave in its vicinity. The most extended of the ramifications which compose it reaches to over 2 miles from the entrance, at which the River Poik disappears, and is heard rushing below. The stalactites and stalagmites are of the most varied and often beautiful forms, and have received fanciful appellations, as they resemble columns, statues, etc.

**ADELUNG** (ād'e-lụng), **Friedrich von.** Nephew of J. C. Adelung, was a distinguished philologist. He was tutor to the Grand-duke Nicholas, afterwards Emperor of Russia, and became president of the Academy of Sciences at St. Petersburg (now Leningrad). Born 1768, died 1843.

**ADELUNG, Johann Christoph.** A German philologist, born 1732, died 1806. In 1759 he was appointed professor in the Protestant academy at Erfurt, and two years after removed to Leipzig, where he applied himself to the works by which he made so great a name, particularly his German dictionary, *Grammatisch-kritisches Wörterbuch der hochdeutschen Mundart* (Leipzig, 1774-86), and his *Mithridates*, a work on general philology. In 1787 he was appointed librarian of the public library in Dresden—an office which he held till his death.

**A'DEN.** A seaport town and territory belonging to Britain, on the south-west coast of Arabia, in a dry and barren district, the town being almost entirely closed in by an amphitheatre of rocks, and possessing an admirable harbour. Aden is strongly fortified and garrisoned, and is an important fuelling station for steamers. It carries on a great amount of commerce, forming an entrepôt and place of transhipment for goods valued at £6,000,000 a year. Its greatest drawback is the scarcity of fresh water, which is obtained partly from wells, partly from rock-




Map showing position of Aden

cisterns that receive the rain, and partly by condensation from salt water—the only unfailing means of supply.

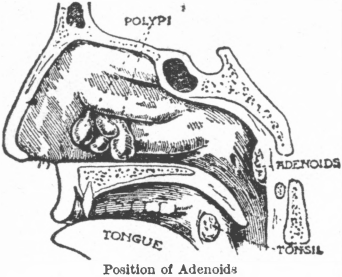
Aden was acquired by Britain in 1839, after which it was attacked repeatedly by the Arabs. With the additional territory latterly acquired, the total British area is 75 sq. miles (or with the island of Perim, 80); while a large tract is under British influence. In 1927 the British Government became entirely responsible for the political and military administration of Aden, the Government of India remaining responsible for the internal administration. In the following year the military command came, in every respect, under Royal Air Force control. In 1932 the Protectorate was separated from

Bombay and placed under the direct control of the Government of India. The territory was formed into a Chief Commissionership to be called the Chief Commissionership of Aden.

The **Gulf of Aden** is a branch of the Indian Ocean leading up to the entrance to the Red Sea. Pop. 50,809.

**ADENANTHE'RA.** A genus of trees and shrubs, natives of the East Indies, nat. ord. Leguminosæ. *A. pavonina* is one of the largest and handsomest trees of India, and yields hard solid timber called red sandal-wood. The bright scarlet seeds, from their equality in weight (each = 4 grains), are used by goldsmiths in the East as weights.

**ADENI'TIS** (Gr. *adēn*, a gland). In medicine, inflammation of one or more of the lymphatic glands.




Position of Adenoids

**AD'ENOIDS.** Small growths often occurring in the back wall of the throat in children, blocking the nostrils and commonly causing deafness. They can be removed by a simple operation.

**ADERER'.** *See* ADRAR.

**ADERNO'.** A town of Sicily, 22 miles by rail N.W. of Catania and about 10 miles W.S.W. of Mount Etna. Pop. 40,000.

**ADESSENA'RIAN.** One of a sect of Christians which holds that there is a real presence of Christ in the Eucharist, but denying that it is effected by transubstantiation.

**ADHESION.** The tendency of two bodies to stick together when put in close contact, or the mutual attraction of their surfaces; distinguished from *cohesion*, which denotes the mutual attraction between the particles of a homogeneous body. Adhesion may exist between two solids, between a solid and a fluid, or between two fluids. A plate of glass or of polished metal laid on the surface of water and attached to one arm of a balance will support much more than its own weight in the opposite scale from the force of adhesion between the water and the plate. From the same force arises the tendency of most liquids, when gently poured from a jar, to run down the exterior of a vessel or along any other surface they meet.

**ADIAN'TUM.** A genus of ferns; the maidenhair fern.

**ADIGE** (ä'dē-jā), Ger. *Etsch* (ancient **ATHESIS**). A river of Northern Italy, which rises in the Rhætian Alps, and after a south and east course of about 180 miles falls into the Adriatic, forming a delta connected with that of the Po.

**ADIGEEVSKO-CHERKESS.** *See* RUSSIA.

**AD'IPOCERE** (-sēr) (Lat. *adeps*, fat, and *cera*, wax). A substance of a light-brown colour formed by animal matter when protected from atmospheric air, and under certain circumstances of temperature and humidity. It was first observed by Fourcroy, and a quantity discovered at the Cimetière des Innocents, Paris. A similar substance is found in peat-bogs in Wales and Ireland.

**AD'IPOSE TISSUE.** The cellular tissue containing the oily or fatty matter of the body. It underlies the skin, surrounds the large vessels and nerves, invests the kidneys, etc., and sometimes accumulates in large masses.

**ADIRON'DACK MOUNTAINS.** In the United States, a group belonging to the Appalachian chain, extending from the N.E. corner of the State of New York to near its centre. The scenery is wild and grand, diversified by numerous beautiful lakes, and the whole region is a favourite resort of sportsmen and tourists.

**AD'IT.** A more or less horizontal opening, giving access to the shaft of a mine. It is made to slope gradually from the farthest point in the interior to the mouth, and by means of it the principal drainage is usually carried on. *See* MINE.

**AD'JECTIVE.** In grammar, a word used to denote some quality in the noun or substantive to which it is accessory. The adjective is indeclinable in English (but has *degrees* of comparison), and generally precedes the noun, while in most other European languages it follows the inflections of the substantive, and is more commonly placed after it, though in German it precedes it, as in English.

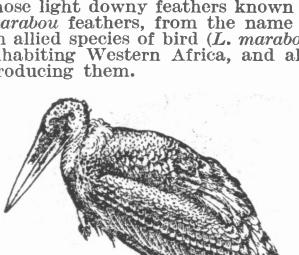
**ADJUDICA'TION.** In English law, is the decree of the court in bankruptcy declaring a person bankrupt.

**ADJUST'MENT.** In marine insurance, is the settling of the amount

of the loss which the insurer is entitled under a particular policy to recover, and if the policy is subscribed by more than one underwriter, of the amounts which the underwriters respectively are liable to pay.

**AD'JUTANT.** An officer appointed to each regiment or battalion, whose duty is to assist the commander. He is charged with instruction in drill, and all the interior discipline, duties, and efficiency of the corps. He has the charge of all documents and correspondence, and is the channel of communication for all orders.

**ADJUTANT-BIRD** (*Leptoptilus argăla*). A large grallatorial or wading bird of the stork family, native of the warmer parts of India, where it is known as Hurgĭla or Argăla. It stands about five feet high, has an enormous bill, nearly bare head and neck, and a pouch hanging from the under part of the neck. It is one of the most voracious carnivorous birds known, and in India, from its devouring all sorts of carrion and noxious animals, is protected by law. From underneath the wings are obtained those light downy feathers known as *marabou* feathers, from the name of an allied species of bird (*L. marabou*) inhabiting Western Africa, and also producing them.



The Adjutant bird—a member of the stork family

**ADJUTANT-GENERAL.** In Great Britain the second military member of the Army Council, and styled Adjutant-general to the Forces. He is a general officer, and at the head of his department at the War Office, which is charged with all duties relative to personnel.

Among the Jesuits this name was given to a select number of fathers, who resided with the general of the order, and had each a province or country assigned to him.

**AD'JUTATORS.** In English history, representatives elected by the parliamentary forces in 1647 to act with the officers in compelling Parliament to satisfy the demands of the army.

**ADLER, Victor.** Austrian socialist leader, born in 1852. Educated as a physician, he gave up his profession for socialist propaganda. He visited England, and wrote a book on factory inspection in this country. He was the founder and editor of the *Arbeiter-Zeitung*; was a member of the Lower Austrian Diet and of the Imperial Council in 1907. His son, Dr. Friedrich Adler, assassinated Count Stuergkh, the Austrian premier, on 20th Oct., 1916. He died in 1918.

**AD'LINGTON.** A straggling place in Lancashire to the south-east of Chorley, engaged in the cotton manufacture. Pop. 4179.

**ADME'TUS.** In Greek mythology, King of Pheræ, in Thessaly, and husband of Alcestis, who gave signal proof of her attachment by consenting to die in order to prolong her husband's life. *See* ALCESTIS.

**ADMINISTRA'TION.** In politics, the executive power or body, the ministry or cabinet.

**ADMIN'ISTRATOR.** In law, the person to whom the goods of a man dying intestate are committed by the proper authority, and who is bound to account for them when required.

**AD'MIRAL.** The commander-in-chief of a squadron or fleet of ships of war, or of the entire naval force of a country, or simply a naval officer of the highest rank. In the British navy admirals are of four ranks—admiral of the fleet, admiral, vice-admiral, and rear-admiral. They were also divided formerly into three classes, named after the colours of their respective flags, admirals of the *red*, of the *white*, and of the *blue*. In 1864, however, this distinction was given up, and now there is one flag common to all ships of war, namely, the white ensign divided into four quarters by the cross of St. George, and having the union in the upper corner next the staff.

The title *admiral of the fleet* is conferred on a few admirals, and carries an increase of pay along with it.—A *vice-admiral* is next in rank and command to the admiral: he carries his flag at the foretop-gallant-mast head, while an admiral carries his at the main. A *rear-admiral*, next in rank to

the vice-admiral, carries his flag at the mizzentop-gallant-mast head.

**Lord High Admiral.** In Great Britain, as officer who (when this rare dignity is conferred) is at the head of the naval administration of Great Britain. There have been few high admirals since 1632, when the office was first put in commission. James Duke of York (afterwards James II.) held it for several years during Charles II.'s reign. In the reign of William and Mary it was vested in lords commissioners of the admiralty, and since that time it has been held for short periods only by Prince George of Denmark (1702-8) in the time of Queen Anne, and by William IV., then Duke of Clarence, in 1827-8.

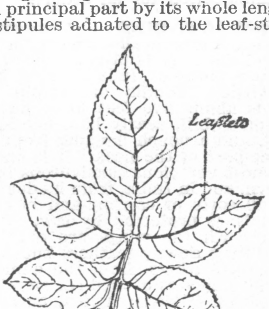
**AD'MIRALTY.** That department of the government of a country that is at the head of its naval service. In Britain the board of Admiralty now consists of the First Lord of the Admiralty and seven other commissioners, four of them being Sea Lords, and one a Civil Lord. The First Lord is always a member of the cabinet, and it is he who principally exercises the powers of the department. Under the 1912 Admiralty Organisation Scheme, the various members of the board are responsible for special business. Several changes in Admiralty organisation were made during the European War, but after the cessation of hostilities the system reverted to that of peace time.

**ADMIRALTY, Court of.** Originally the court of the Lord High Admiral. Its jurisdiction is now exercised by the Probate, Divorce, and Admiralty Division of the High Court of Justice, and includes claims to the possession of a ship, for seamen's wages, for damages done by a ship, and all questions of "prize," *i.e.* enemy property captured at sea. It differs from the Common Law notably in dividing liability in proportion to negligence and in the power of the court to "arrest" (*i.e.* seize) disputed property. In cases involving nautical skill the judge is assisted by two of the Elder Brethren of Trinity House.

**ADMIRALTY ISLAND.** An island belonging to the United States off the north-west coast of North America, 80 or 90 miles long and about 20 broad, covered with fine timber and inhabited by Sitka Indians.

**ADMIRALTY ISLANDS.** A cluster of 40 islands, north of New Guinea, in what was once called the Bismarck Archipelago. Discovered by the Dutch explorer Shouten in 1616, they were in German possession from 1884 to 12th Sept., 1914, when they were occupied by an Australian force. They have since been in British occupation. The largest is about 60 miles in length; the rest are much smaller. They are covered with a luxuriant vegetation, and possess dense groves of coconut trees. There are valuable pearl and other shell fisheries. The chief island is Manus, which is sometimes known as Great Admiralty Island, and the chief town is Lorengau. The population of the group is estimated at 14,067, only 50 of whom are Europeans.

**AD'NATE.** In botany, applied to a part growing attached to another and principal part by its whole length, as stipules adnated to the leaf-stalk.




A stipule adnated to a leaf-stalk

**ADOBE** (à-dō'bā). The Spanish name for a brick made of loamy earth, containing about two-thirds fine sand and one-third clayey dust, sun-dried; in common use for building in Mexico, Texas, and Central America. Building material in ancient Egypt and Assyria was adobe.

**ADOL'PHUS, John,** 1768-1845. An able English criminal lawyer, and author of the *History of England from the Accession of George III.* and *Biographical Memoirs of the French Revolution.*

**ADOLPHUS OF NASSAU.** Elected Emperor of Germany, 1292. In 1298 the college of electors transferred the crown to Albert of Austria, but, Adolphus refusing to abdicate, a war ensued in which he fell, after a heroic resistance, 2nd July, 1298.

**ADONAI** (ad'o-nī). A name bestowed upon God in the Old Testament. *See* JEHOVAH.

**ADONAIS.** Title of a famous elegiac poem written by Percy Bysshe Shelley on the death of his fellow-poet Keats. In it Shelley calls upon the Hours, the Earth, all Nature and

all Art to mourn the untimely death of the poet and do honour to the blighted flower of his genius. In the beauty and passionate grief of its language it is only surpassed by Milton's *Lycidas*. Adonais is probably a form of Adonis, for whom laments were made by classical poets.

**ADO'NI.** A town and district in Madras; pop. of former 30,232, of latter 179,418. It is well known for excellent silk and cotton fabrics.

**ADONIJAH.** Son of David. He claimed to be his father's heir. Joab and Abiathar supported him, but the old king, persuaded by Bathsheba, caused Solomon to be anointed as the next ruler. He then pardoned Adonijah, but after his death Solomon had him killed.

**ADO'NIS.** Son of Myrrha, a mythological personage, originally a deity of the Phœnicians, but borrowed into Greek mythology. He was represented as being a great favourite of Aphroditē (Venus), who accompanied him when engaged in hunting, of which he was very fond. He received a mortal wound from the tusk of a wild boar, and when the goddess hurried to his assistance she found him lifeless, whereupon she caused his blood to give rise to the anemone. The worship of Adonis, which arose in Phœnica, was afterwards widely spread round the Mediterranean. He is the reproductive principle, nature's decay in winter and its revival in spring. The name Adonis is akin to the Heb. *Adonai*, Lord. *See* TAMMUZ.

**ADO'NIS.** A small river rising in Lebanon and flowing to the Mediterranean. When in flood it is tinged with a red colour, and so is connected with the legend of Adonis.

**ADO'NIS.** A genus of ranunculaceous plants. In the corn-adonis or pheasant's eye (*A. autumnālis*) the petals are bright scarlet like the blood of Adonis, from which the plant is fabled to have sprung.

**ADOPTIANISM.** The theory according to which Christ as a man is the adopted Son of God. Elipandus, Archbishop of Toledo, and Felix, Bishop of Urgella, asserted this double sonship in Christ, maintaining that He was indeed the Son of God in His divine nature, but as man He was the Son of God only by grace and adoption. "The Man Christ" is therefore only the adopted and not the natural Son of God. The doctrine was vigorously opposed by Alcuin, and condemned by the councils of Ratisbon (792) and Frankfort (794). The theory, however, found advocates during the Middle Ages, and has given rise to theological disputes in modern times. Adoptianism was attributed both to Abelard and Duns Scotus.

**ADOPTION.** The admission of a stranger by birth to the privileges of a child. Amongst the ancient Greeks and Romans and also some modern nations adoption is placed under legal regulation. In Rome the effect of adoption was to create the legal relation of father and son, just as if the person adopted was born of the blood of the adopter in lawful marriage. The adopted son took the name of his adopter, and was bound to perform his new father's religious duties.

Adoption is not recognised in Scotland nor was it in England until 1926. Now by the Adoption of Children Act, 1926, a High Court or County Court judge may with the consent of the child's parents, unless they have abandoned it, transfer to a person twenty-one years older than the child and at least twenty-five years of age the rights and duties of parenthood. A register of adopted children is kept at Somerset House, London.

After the World War devastated towns in France and Belgium were adopted by British towns, the idea being that the adopter would help to repair the damage done.

**ADOUR** (à-dör). A river of France, rising in the Hautes Pyrenees, and falling into the sea a little below Bayonne; length 208 miles.

**ADO'WA.** A town of Abyssinia, in Tigré, at an elevation of 6270 feet; the chief commercial depot on the caravan route from Massawa to Gondar. Pop. 5000. Here the Italians suffered a crushing defeat at the hands of the Abyssinians, 1st March, 1896.

**ADRA** (ā'drà). A seaport of Southern Spain, in Andalusia, near the mouth of the Adra, on the Mediterranean; with marble quarries and lead works. Pop. 11,246.

**ADRAMIT'TI** (ancient **ADRAMYTTIUM**; Turk. *Edremid*). A town of Turkey in Asia, near the head of the gulf of the same name, 80 miles north of Smyrna. Pop. about 5000.

**ADRAR'.** A district in the Western Sahara, peopled by Berbers possessing camels, sheep, and oxen, and cultivating dates, wheat, barley, and melons. Chief towns, Wadan and Shingit, which has inexhaustible beds of rock-salt.

**ADREN'ALIN,** or **SUPRARENIN.** A crystalline substance obtained from the adrenals or suprarenal capsules of

cattle and sheep, which possesses the property of checking bleeding by its stypic or contractive powers, and is used in medical practice, more especially in the case of bleeding at the nose and nervous catarrh.

**ADRIA** (ā'dri-ȧ). A cathedral city of Northern Italy, province of Rovigo, between the Po and the Adige, on the site of the ancient town of same name, whence the Adriatic derives its appellation. Owing to alluvial deposits the sea is now 17 miles distant. Pop. 15,860.

**A'DRIAN.** The name of six Popes. The first, a Roman, ruled from 772-795; a contemporary and friend of Charlemagne. He expended vast sums in rebuilding the walls and restoring the aqueducts of Rome.—**Adrian II.**, a Roman, was elected Pope in 867, at the age of seventy-five years. He died in 872, in the midst of conflicts with the Greek Church.—**Adrian III.**, a Roman, elected 884, was Pope for one year and four months only. He was the first Pope who changed his name on the occasion of his exaltation.

**Adrian IV.** Originally named **Nicolas Breakspear,** the only Englishman who ever occupied the papal chair, was born about 1100, and died 1159. He is said to have been a native of Hertfordshire, studied in France, and became abbot of St. Rufus in Provence, cardinal and legate to Norway. Chosen Pope in 1154, his reign is chiefly remarkable for his almost constant struggle for supremacy with Frederick Barbarossa, who on one occasion had been forced to hold his stirrup, and had been crowned by him at Rome (1155). He issued the famous bull (1158) granting the sovereignty of Ireland, on condition of the payment of Peter's pence, to Henry II.

**Adrian V.** Previously called **Ottobuono Fieschi,** of Genoa, settled, as legate of the Pope, the dispute between King Henry III. of England and his nobles, in favour of the former; but died a month after his election to the papal chair (1276).—**Adrian VI.** (the last pontifice barbaro), born at Utrecht in 1459, was elected to the papal chair, 9th Jan., 1522. He tried to reform abuses in the Church, but opposed the zeal of Luther with reproaches and threats, and even attempted to excite Erasmus and Zuinglius against him. Died 1523, after a reign of one year and a half.

**A'DRIAN.** A town of the United States, in Michigan, 70 miles W.S.W. of Detroit. Its extensive water-power is employed in works of various kinds. Pop. 13,064.

**A'DRIAN, Publius Ælius Hadrianus.** *See* HADRIAN.

**ADRIANO'PLE, or EDIRNE** (Turk. *Edreneh*). An important city in the Balkans, about 137 miles by rail W.N.W. from Constantinople, on the Maritza (ancient *Hebrus*), at its junction with the Tundja and the Arda. It has a great mosque, among the most magnificent in the world; a palace, now in a state of decay; a grand aqueduct, and a splendid bazaar; manufactures of silk, woollen, and cotton stuffs, otto of roses, leather, etc., and an important trade.

Adrianople received its present name from the Roman emperor Adrian (Hadrian). In 1361 it was taken by Amurath I., and was the residence of the Turkish sovereigns till the conquest of Constantinople in 1453. In 1829 it was taken by the Russians, and here was then concluded the peace of Adrianople, by which Russia received important accessions of territory in the Caucasus and on the coast of the Black Sea. The Russians occupied it also in 1878. Adrianople was bombarded by the Balkan allied forces in Feb., 1913, and after changing hands several times became finally Turkish by the Treaty of Lausanne (1923). Pop. 34,528.

**ADRIAN'S (or HADRIAN'S) WALL.** *See* ROMAN WALLS.

**ADRIAT'IC SEA, or GULF OF VENICE.** An arm of the Mediterranean, stretching in a north-westerly direction from the Straits of Otranto, between Italy and the Balkan Peninsula (Yugoslavia). Length 460 miles; average breadth, 90 miles; area, about 60,000 sq. miles. The rivers which it receives, particularly the Po, its principal feeder, have produced, and are still producing, great geological changes in its basin by their alluvial deposits. Hence Adria, between the Po and the Adige, which gives the sea its name, though once a flourishing seaport, is now 17 miles inland. An oceanographic investigation of the Adriatic Sea took place in Feb. and March, 1911. The principal trading ports on the Italian side are Brindisi, Bari, Ancona, Sinigaglia, and Venice; on the east side Ragusa, Fiume, Pirano, Pola, and Trieste (Italian).

**ADSCRIPTI GLEBÆ** (Lat., persons attached to the soil). A term applied to a class of Roman slaves attached in perpetuity to and transferred with the land they cultivated. Colliers and salt workers in Scotland were in a similar position till 1775.

**ADULA'RIA.** A very pure, limpid, translucent variety of the common felspar, called by lapidaries *moonstone*, on account of the play of light exhibited by the arrangement of its

crystalline structure. It is found on the Alps, but the best specimens are brought from Ceylon. It is so called from *Adula*, one of the peaks of St. Gothard, where fine specimens are got.

**ADULT.** Person 21 years old and over. An adult is legally entitled to do as he likes as regards marriage and dealing with money, provided he does not break the law.

**Adult Schools** are schools for the instruction of men and women. They exist in many cities and towns of Great Britain, often being conducted by members of the Society of Friends. The British Institute of Adult Education is at 39 Bedford Square, London, W.C.1.

**ADULTERA'TION.** A term applied to the fradulent mixture of articles of commerce, foods, drugs, beverages, seeds, etc., with inferior ingredients, and also to any accidental impurity found in a substance. The chief objects of adulteration are to render a substance more pleasing in appearance, to increase the weight, to make an inferior article appear as good as the article of superior quality. Any substance added to an article to increase its bulk, weight, colour, etc., is spoken of as an adulterant. Milk is often adulterated with water and with colouring-matter. Butter may be adulterated by mixing with it other fats or by the addition of colouring-matter. Nearly every article of food can be adulterated in some way to make it appear of finer quality.

**Preservatives** added to foods and drugs generally may be classed as adulterants. Thus cream is preserved by adding small quantities of boric acid. Beer sometimes contains salicylic acid added as a preservative. Chloroform contains a small quantity of alcohol to prevent decomposition. Methylated spirits is alcohol adulterated in several ways to render it unfit for human consumption. Tobacco contains benzoic acid as preservative, and sometimes saltpetre to aid burning. Many of these adulterants are harmful, so that such added to foods and beverages must be present only in very small quantities. Food and Drug Acts lay down the limits of the quantities of foreign matter permitted either as preservative or impurity. Practically every article of commerce is adulterated in some way, and pure substances are seldom used.

In Great Britain it is illegal to adulterate food and drink, and inspectors are appointed by the county and borough councils to visit shops and examine the articles sold. An inspector can buy a sample of anything he thinks is adulterated and have it analysed. If the analyst finds it is adulterated, the offender can be heavily fined. Cf. Walker, *The Food Inspector's Encyclopædia*.

**ADUL'TERY.** The voluntary sexual intercourse of a married person with any other than the offender's husband or wife; when committed between two married persons, the offence is called double, and when between a married and single person, single adultery. The Mosaic, Greek, and early Roman law only recognized the offence when a married woman was the offender. By the Jewish law it was punished with death. In Greece the laws against it were severe. By the laws of Draco and Solon adulterers, when caught in the act, were at the mercy of the injured party.

In early Rome the punishment was left to the discretion of the husband and parents of the adulteress. The punishment assigned by the Lex Julia, under Augustus, was banishment or a heavy fine. Under Constantius and Constans, adulterers were burned or sewed in sacks and thrown into the sea; under Justinian the wife was to be scourged, lose her dower, and be shut up in a monastery; at the expiration of two years the husband might take her again; if he refused she was shaven and made a nun for life. By the ancient laws of France this crime was punishable with death. In Spain personal mutilation was frequently the punishment adopted. In several European countries adultery is regarded as a criminal offence, but in none does the punishment exceed imprisonment for a short period, accompanied by a fine. In England formerly it was punishable with fine and imprisonment, and in Scotland it was frequently made a capital offence. In Great Britain at the present day, however, it is punishable only by ecclesiastical censure. The aggrieved husband, however, can obtain damages against his wife's seducer.

In England since 1858 a man can obtain a decree for the dissolution of his marriage on the ground of his spouse's adultery, and since the 18th July, 1923, a wife has had a similar right. Before that date she had to prove the commission by the husband of other offences also, such as bigamy, desertion, cruelty, etc. A decree of judicial separation could always have been obtained by either of the spouses, leaving them still married persons but otherwise discharged from their obligations to each other as such. In the United States adultery is regarded as a civil injury as well as a criminal offence.

**AD VALO'REM** (Lat., according to the value). A term applied to customs or duties levied according to the worth of the goods, as sworn to by the owner, and not according to number, weight, measure, etc.

**ADVANCE-NOTE.** A draft on the owner of a vessel, generally for one month's wages, given by the master to the sailors on their signing the articles of agreement. The granting of such notes to British sailors was made illegal by an Act passed in 1880.

**AD'VENT** (Lat. *adventus*, an arrival, " the coming of our Saviour "). The name applied to the holy season which occupies the four or, according to the Greek Church, six weeks preceding Christmas, and which forms the first portion of the ecclesiastical year, as observed by the Anglican, the Roman Catholic, and the Greek Church.

**AD'VENTISTS.** A group of six American religious sects who believe in the speedy coming of Christ, and generally practise adult immersion. The first sect of Adventists was founded by William Miller in 1831.

There is also a sect called *Seventh-day Adventists*, who hold that the coming of Christ is at hand, and maintain that the Sabbath is still the seventh day of the week.

**ADVERTIS'ING.** Advertising on a small scale is a practice as old as commerce ; but modern advertising on a large scale cannot be dated further back than 1785, when *The Times* was founded. The last thirty years have witnessed a great increase in the importance of advertisements as part of the policy of a progressive business. Much more intelligence and vastly more money is now spent on advertising than ever was before. America led the way, but the British are not now far behind in the number and ingenuity of their advertisements. Until 1853 a duty on newspaper advertisements retarded the growth of advertising in Great Britain. The removal of this duty helped its development, but a greater impetus came from improvements in printing which enabled illustrations to be used on a lavish scale.

There are roughly speaking five distinct types of advertisement :—

(1) Press advertising, under which heading is included daily and weekly newspapers, monthly magazines and year books, directories, etc.

(2) Mail-order advertising, which comprises form-letters, catalogues.

(3) Poster and showcard advertising. This includes large and small posters, on hoardings, in railway stations or tubes, etc.

(4) Illuminated signs either outside buildings on a large scale or in frames of various sizes inside business premises, theatres etc.,

(5) Cinema advertising—a recent development which has proved extremely effective.

Advertising to be successful must be carefully organised. A firm wishing to advertise must first of all settle how much money it is willing to spend on this object. A common practice is to devote a fixed proportion of the profits—at least five per cent—to advertising. The firm must then carefully consider the period of time over which the expenditure agreed upon is to be spread. Occasional or spasmodic advertising does not produce satisfactory results ; advertising must be constant and must move with the times in order to be effective. A firm not uncommonly reviews the results of its advertising every six months, when it also arranges its plans for future advertisements. Mistakes in policy can thus be corrected and successful schemes can be readopted or improved upon.

Advertising on any large scale must be handled by experts. Many thousands of pounds are wasted yearly by firms which hand over this work to a director who has no knowledge of how to advertise. The proper way for a firm to act, if it wishes to enter upon a campaign of publicity, is to engage an efficient advertising staff or to employ a reliable advertising agent. These agents in many cases obtain their profits from the commission given to them by newspapers—this often being about ten per cent of the cost of the space booked. In return for this they give their advice and copy—everything, indeed, except blocks and sketches.

By law an advertisement becomes a contract as soon as a member of the public accepts the offer made to him. The goods must be of the nature described, or the buyer can obtain damages. The law of copyright is also of interest to advertisers, whose writings and drawings are protected by it. Under the town planning acts local authorities have the power to prevent the appearance of advertisements that disfigure the landscape. Indecent advertisements are illegal in Great Britain.

Advertising clubs are The Thirty Club, the Aldwych Club, The Regent Club, etc., and the chief association is the Advertising Association at 110 Fleet Street, London, E.C.4. The chief papers for the trade are *The Advertising World* and *The Advertisers' Weekly*. There are also international advertising organisations and world conferences are held

from time to time.—BIBLIOGRAPHY: H. C. Link, *New Psychology of Selling and Advertising*; H. N. Casson, *How to Make Advertising Pay*; N. Borden, *Problems in Advertising*; A. P. Braddock, *Psychology and Advertising*; A. T. Possenberger, *Psychology in Advertising*; L. Carr, *Uneconomics in Advertising*; T. Russell, *Commercial Advertising*.

**AD VITAM AUT CULPAM** (Lat., for life or till a fault). A formula often used in regard to appointments to posts or offices, intimating that they are held for life or till the person forfeits his position by some fault or misdeed.

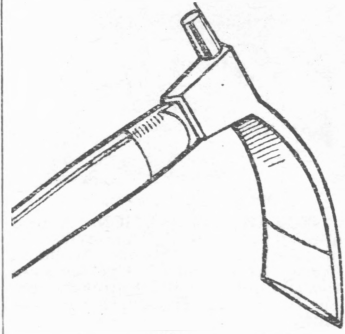
**AD'VOCATE** (Lat. *advocatus—ad*, to, *voco*, to call). A lawyer authorized to plead the cause of his clients before a court of law. It is only in Scotland that this word seems to denote a distinct class belonging to the legal profession, the advocates of Scotland being the pleaders before the supreme courts, and corresponding to the *barristers* of England and Ireland. These advocates all belong to the *Faculty of Advocates*, Edinburgh, to whom the oral pleadings in the Court of Session are for the most part limited, while they are also competent to plead in all the inferior Scottish courts and in the House of Lords in cases of appeal from the Court of Session. The supreme judges in Scotland, as well as the sheriffs of the various counties, are always selected from among them. Candidates for admission must undergo two separate examinations, one in general scholarship and the other in law.

**The Lord-Advocate,** called also the *King's* or *Queen's Advocate*, is the principal law officer of the crown in Scotland. He is the public prosecutor of crimes in the Supreme Court, and senior counsel for the crown in civil causes. Being appointed by the crown, he goes out of office with the administration to which he belongs. As public prosecutor he is assisted by the solicitor-general and by four junior counsel called advocates-depute. The lord-advocate and the solicitor-general, in addition to their official duties, accept of ordinary bar practice.

**ADVOCATES' LIBRARY.** The chief library in Scotland, located in Edinburgh, and founded about 1682 by the Faculty of Advocates. It was increased by donations and by sums granted by the Faculty from time to time. As the donations were not confined to advocates the library was considered a kind of public library. In 1709 it obtained, along with eight other libraries, the right to demand a copy of every new book published in Britain, which right it still possesses. The number of volumes is over 800,000 and MSS. over 3200. In 1925 it was given to the nation, and is now the National Library of Scotland.

**ADVOCA'TUS DIAB'OLI** (Devil's advocate). In the Roman Catholic Church, a functionary who, when a deceased person is proposed for canonization, brings forward and insists upon all the weak points of the character and life of the deceased, endeavouring to show that he is not worthy of sainthood. The first formal mention of such an officer occurs under Pope Leo X. (1513-21). The opposite side is taken by the *Advocatus Dei* (God's advocate).

**ADVOWSON.** In English law, the right, held by a *patron*, of nominating a cleric to hold a vacant benefice in the Church of England. Advowsons were of three kinds—*presentative*, *collative*, and *donative*: *presentative*, when the patron presents his clerk to the bishop of the diocese to be instituted; *collative*, when the bishop is the patron and institutes or *collates* his clerk by a single act; *donative* (converted to presentative by an Act of 1898), when a church was founded by the king, or any person licensed by him, without being subject to the ordinary, so that the patron conferred the benefice on his clerk without presentation or institution. Where an advowson is owned by a Roman Catholic the presentation must be made by the University of Oxford or of Cambridge. The right of sale of advowsons has been recently much restricted by law and will presently cease.



Adze

**ADZE.** A cutting instrument used for chipping the surface of timber, somewhat of a mattock shape, and having a blade of steel forming a portion of a cylindrical surface, with

a cutting edge at right angles to the length of the handle.

**Æ'ACUS.** Son of Zeus by a nymph, Ægina. The Greeks believed the god Æacus to be particularly just. After his death, therefore, Pluto made him one of the judges of the lower world.

**ÆDILES** (ē'dīlz). Roman magistrates who had the supervision of the national games and spectacles; of the public edifices, such as temples (the name comes from *ædes*, a temple); of private buildings, of the markets, cleansing and draining the city, etc.

**Æ'DUI.** One of the most powerful nations of Gaul, between the Liger (Loire) and the Arar (Saône). On the arrival of Julius Cæsar in Gaul (58 B.C.) they were subject to Ariovistus, but their independence was restored by Cæsar. Their chief town was Bibracte (Mont Beuvray, near Autun).

**ÆGADE'AN ISLANDS.** A group of small islands lying off the western extremity of Sicily, and consisting of Maritimo, Favignana, Levanso, and Le Formiche.

**ÆGAG'RUS.** A wild species of ibex (*Capra ægagrus*) found in herds on the Caucasus.

Grecian Ibex (*Capra ægagrus*)

**ÆGEAN CIVILISATION.** A term applied to the pre-Hellenic civilisation of south-eastern Europe, including Crete, Greece and the Cyclades, and the Danubian or Mid-European area. *See* CRETE and DANUBIAN CIVILISATION.

**ÆGEAN SEA** (ē-jē'an). That part of the Mediterranean which washes the eastern shores of Greece, and the western coast of Asia Minor. *See* ARCHIPELAGO.

**Æ'GILOPS.** A genus of grasses, very closely allied to wheat, and somewhat remarkable from the alleged fact that by cultivation one of the species becomes a kind of wheat.

**ÆGINA** (ē-ji'na). A Greek island in the Gulf of Ægina, south of Athens, triangular in form; area about 41 sq. miles; pop. 9000. It forms part of the nomarchy of Attica and Bœotia. Except in the west, where the surface is more level, the island is mountainous and unproductive. The inhabitants are chiefly engaged in trade, seafaring, and agriculture, the chief crops being almonds, olives, and grain. The greater number of them reside in the seaport town of Ægina.

Ægina was anciently colonized by Dorians from the opposite coast of Peloponnesus. In the latter half of the sixth century B.C. it had a flourishing commerce, a large navy, and was the seat of a distinct school of art. At the battle of Salamis (480 B.C.) the Æginetans behaved with great valour. In 456 the island fell under the power of the Athenians, and in 431 the Æginetans were expelled to make room for Athenian settlers, but were afterwards restored.

On a hill are the remains of a splendid temple of Athena (Minerva), many of the columns of which are still standing. Here was found in 1811 a considerable amount of sculpture from the pediments (the *Æginetan marbles*), which is now at the Glyptothek at Munich, and is prized as throwing light on the early history of Greek art. Though in these figures there is a wonderfully exact imitation of nature, yet there is a certain stiffness about them and an unnatural sameness of expression in all. They should probably be assigned to the period 500-480 B.C.

**Æ'GIR.** One of the Norse gods. He was the giant of the seashore. His wife was the storm goddess and his daughters the billows. The tidal wave on the Trent is called the ægir.

**ÆGIS** (ē'jis). The shield of Zeus, according to Homer, but according to later writers and artists a metal cuirass or breastplate, in which was set the head of the Gorgon Medusa, and with which Athena (Minerva) is often represented as being protected. In a figurative sense the word is used to denote some shielding or protecting power.

**ÆGLE** (ē'glē). A genus of plants. *See* BEL.

**ÆGOSPOT'AMI** (" goat-rivers "). A place on the Hellespont, of some note in Greek history, the Athenian fleet being here completely defeated in 405 B.C. by the Spartan Lysander, thus ending the Peloponnesian war.

**ÆLFRIC** (al'frik), **Abbot.** Called *Grammaticus* (the grammarian). Was a celebrated English author of the eleventh century. He became a monk of Abingdon, was afterwards connected with Winchester, and died Abbot of Eynsham. His principal works are two books of homilies, a *Treatise on the Old and New Testaments*, a translation and abridgement of the first seven books of the Bible, a *Latin Grammar and Glossary*, etc. He has been frequently confounded both with Ælfric, Archibishop of Canterbury, and Ælfric, Archbishop of York, surnamed Putta, who lived about the same time. There was also an Ælfric of Malmesbury.

**ÆLIA'NUS, Claudius.** Often called simply **Ælian,** a Roman author who lived about A.D. 221, and wrote in Greek a collection of stories and anecdotes and a natural history of animals.

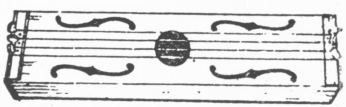
**ÆLIA'NUS TACTICUS.** So called to distinguish him from Claudius Ælianus, lived at Rome, and wrote a work *On the Military Tactics of the Greeks*, which he dedicated to the Emperor Hadrian, who was emperor from A.D. 117 to 138. This book was closely studied by soldiers of the sixteenth and seventeenth centuries.

**AELST** (ălst). Belgian town, same as **Alost.**

**ÆNE'AS.** The hero of Virgil's *Æněid*, a Trojan, who, according to Homer, was, next to Hector, the bravest of the warriors of Troy. When that town was taken and set on fire, Æneas, according to the narrative of Virgil, with his father, son, and wife Creusa, fled, but the latter was lost in the confusion of the flight. Having collected a fleet he sailed for Italy, but after numerous adventures he was driven by a tempest to the coast of Africa, where Queen Dido of Carthage received him kindly, and would have married him.

Jupiter, however, sent Mercury to Æneas, and commanded him to sail to Italy. Whilst the deserted Dido ended her life on the funeral pile, Æneas set sail with his companions, and after further adventures by land and sea reached the country of King Latinus, in Italy. The king's daughter Lavinia was destined by an oracle to wed a stranger, this stranger being Æneas, but was promised by her mother to Turnus, King of the Rŭtŭli. This occasioned a war, which was ended by Æneas slaying Turnus and marrying Lavinia. His son by Lavinia, Æneas Sylvius, was the ancestor of the kings of Alba Longa, and of Romulus and Remus, the founders of the city of Rome.

**ÆOLIAN HARP,** or **ÆOLUS' HARP.** A musical instrument, generally consisting of a box of thin fibrous wood (often of deal), to which are attached from eight to fifteen fine catgut strings or wires, stretched on low bridges at either end, and tuned in unison. Its length is made to correspond with the size of the window or other aperture in which it is intended to be placed. When the wind blows athwart the strings it produces very beautiful sounds, sweetly mingling all the harmonic tones, and swelling or diminishing according to the strength or weakness of the blast.



Æolian Harp

**ÆOLIANS** (Gr. *Aioleis*). One of the four races into which the ancient Greeks were divided, originally inhabiting the district of Æŏlis, in Thessaly, from which they spread over other parts of Greece. In early times they were the most numerous and powerful of the Hellenic races, chiefly inhabiting Northern Greece and the western side of Peloponnesus, though latterly a portion of them went to Lesbos and Tenedos and the north-west shores of Asia Minor, where they possessed a number of cities. Their language, the Æolian dialect, was one of the three principal dialects of the Greek. It was cultivated for literary purposes chiefly at Lesbos, and was the dialect in which Alcæus and Sappho wrote.

**ÆOL'IPILE** (Lat. *Æŏli pila*, the ball of Æolus). A spherical vessel of metal, with a pipe of small aperture, through which the vapour of heated water in the ball passes out with considerable noise; or having two nozzles so placed that the steam rushing out causes it to revolve on the principle of the Barker's mill. It was known to the ancient Greeks.

**Æ'OLUS.** In Greek mythology, the god of the winds, which he kept confined in a cave in the Æolian Islands, releasing them when he wished or was commanded by the superior gods.

**Æ'ON.** A Greek word signifying life, an age, and sometimes eternity, but used by the Gnostics to express spirits or powers that had emanated from the Supreme Mind before the beginning of time. They held both Christ and the Holy Spirit to be æons; but as they denied the divine origin of the books of Moses, they said that the spirit which had inspired him and the prophets was not that

exalted æon whom God sent forth after the ascension of Christ, but an æon very much inferior, and removed at a great distance from the Supreme Being.

**ÆPYOR'NIS.** A genus of gigantic birds whose remains have been found in Madagascar, where they are supposed to have lived perhaps not longer than 200 years ago. It had three toes, and is classed with the cursorial birds (ostrich, etc.). Its eggs measured 14 inches in length, being about six times the bulk of those of the ostrich. The bird which laid them may well have been the roc of Eastern tradition.

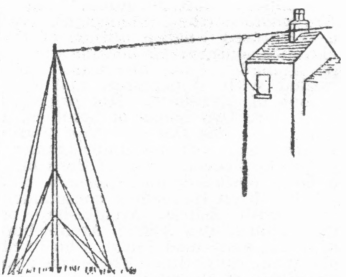
**Æ'QUI.** An ancient people of Italy, conspicuous in the early wars of Rome, and inhabiting the mountain district between the upper valley of the Anio (Teverone) and Lake Fucinus. They were probably akin to the Volscians, with whom they were in constant alliance. They were defeated by Cincinnatus in 458 B.C., and again by the dictator Postumius Tubertus in 428 B.C., and were finally subdued about 304-302 B.C. Soon after they were admitted to Roman citizenship.

**A'ERATED BREAD.** Bread which receives its sponginess or porosity from carbonic acid supplied artificially and not produced by the fermentation caused by leaven or yeast.

**A'ERATED WATERS.** Waters impregnated with carbonic acid gas, and forming effervescing beverages. Some mineral waters are naturally aerated, as Vichy, Apollinaris, Rosbach, etc.; others, especially such as are used for medicinal purposes, are frequently aerated to render them more palatable and exhilarating. Water simply aerated, as soda-water, or aerated and flavoured with lemon or fruit syrups, is largely used, especially in summer, as a refreshing beverage.

There are numerous varieties of apparatus for manufacturing aerated waters. The essential parts of an aerated-water machine are a generator in which the gas is produced, a vessel containing the water to be impregnated, and an apparatus for forcing the gas into the water. This last may be effected by force-pumps or by the high pressure of the impregnating gas itself. The quantity of gas with which the water is charged is usually equal to a pressure of 5 atmospheres. *See also* MINERAL WATERS.—Cf. W. Kirkby, *Evolution of Artificial Mineral Waters.*

**AERIAL.** Wire or wires used with wireless receiving sets in order to transmit or collect the electrical waves. The wire is supported at a



Outside aerial with lead-in to receiving set

height above the ground and insulated except for a connection to earth through the transmitter or receiver. The insulators are pieces of non-conducting material used for fastening the aerial wire to its supports. They are generally made of glass or porcelain. A condenser or inductance, either fixed or variable, is connected to the aerial circuit of a transmitter or receiver in order to tune the circuit to a particular frequency. In Great Britain the length of a private aerial for the reception of broadcasting must not exceed 100 feet. Improvements have made it possible to do without external aerials in certain classes of receiving sets.

**AERIAL ROPEWAYS** or **CABLEWAYS.** A means of transport or carriage in which a great rope or cable, elevated above the ground on fixed supports, is made use of in conveying from place to place materials or articles of various kinds. Such a cable may be said to serve the purpose of a rail, from which are suspended the carriages, buckets, or carriers of whatever sort are employed to convey the materials dealt with, the cable being actuated by means of a steam-engine and winding-gear of suitable construction. Such cables are now much used in carrying materials over a comparatively short space, as in quarries, excavations for canals, docks, etc.; in the construction of bridges, in shipbuilding, etc.

Besides being employed in such works—not to mention the coaling of a battleship at sea from a coal transport standing by—elevated ropeways miles in length have also been constructed between places where no roads exist, or where road carriage is much more expensive. The greatest aerial line yet in existence is in the Argentine Republic, being built to connect a mining locality in the Andes, about 15,000 feet above sea level, with a station on the Northern Railway 11,500 feet lower down and

about 22 miles off, the line running across deep chasms and hollows, and being in places supported on iron towers 130 feet high. The wire rope is said to have a length of 87 miles.

**AË'RIANS.** The followers of Aërius of Pontus, who in the fourth century originated a small heretical sect, objecting to the established feast-days, fasts or abstinences, the distinction between bishops and presbyters, prayers for the dead, etc.

**AERODROME.** The area devoted to the arrival and departure of aircraft and the buildings associated therewith. It may consist of a hangar and workshop, or a large group of buildings, with landing grounds properly marked and lighted with beacons and marked hangars for the machines, workshops for their repair, store rooms, wireless apparatus, etc. When passengers and goods are landed from abroad there must also be a customs station and a bonded warehouse. Waiting and refreshment rooms are also provided, as well as accommodation for the staff. If airships are received there must be a mooring mast.

In Great Britain all aerodromes must be licensed and inspected by the Air Ministry. Since the Great War they have been erected all over the country. In the London area the chief aerodromes are Croydon, Heston and Hendon. Manchester, Liverpool, Bristol, Nottingham, Blackpool and other cities and towns possess aerodromes and many others have been planned.

**AERODYNAM'ICS.** Science concerned with the effect of air in motion, a complementary branch being **aerostatics.** It is of great importance to aeronautics as it examines the resistance offered by the air to bodies moving therein and the pressure exerted upon them. The results reached by experiments of various kinds are studied closely by aeroplane engineers and have much bearing upon the type of machine that is built. There is an aerodynamics department at the National Physical Laboratory, Teddington.

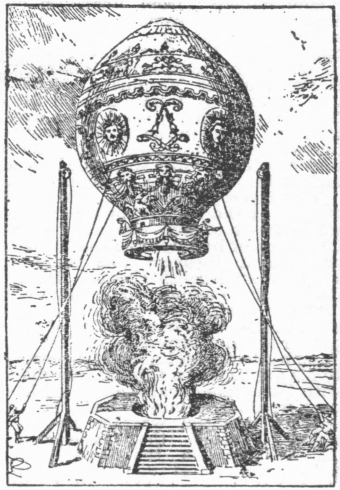
**AERÖE,** or **ARRÖE** (ăr'öu-e). An island of Denmark, in the Little Belt, 15 miles long by 5 broad, with 12,000 inhabitants. Though hilly, it is very fertile.

**A'EROLITE.** A meteoric stone, meteorite, or shooting-star. *See* METEORIC STONES.

**AERONAU'TICS.** The art or science of navigating the air, including Aviation (*see* AEROPLANE and SEA-PLANES) and Aerostation (*see* BALLOONS and AIRSHIPS). From the days of the mythical exploit of Dædalus and Icarus, students of "experimental philosophy," or scientists, of all ages, turned their thoughts and inventive genius to the evolution of a machine by means of which man could fly.

**Early Experiments.** Most of the early schemes of which any details have survived were based upon the observation of birds and embodied the flapping of wings affixed to the arms or legs. Among the very early experimenters may be mentioned the monk Oliver of Malmesbury (A.D. 1050), de Pérouse (1420), who is said to have succeeded in flying over Lake Trasimene, and the great Leonardo da Vinci. All these produced designs for what are known as Ornithopters, or flapping-wing machines.

There was, however, another school which believed in the future of machines which would be themselves lighter than air. The idea in the minds of the experimenters of this school was in the early days the replacing of the air in brass globes by a vacuum. If the brass were thin enough it was believed that the globe would then be sufficiently light to rise. It was, however, not realised that under such



A Hot-air Balloon or "Montgolfière"

circumstances the globe would inevitably collapse under the pressure of the atmosphere with no corresponding internal pressure to withstand it. Among this "lighter-than-air" school of experimenters were the famous Roger Bacon (thirteen century)

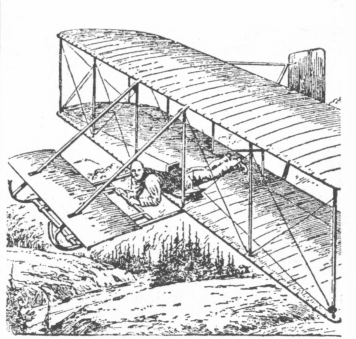
Robert Hooke of the Royal Society (1664), and Francesco de Lana, a Jesuit priest (1660).

It was this school which ultimately achieved success by providing the first machine of any sort to leave the ground and rise into the air. On 5th June, 1783, the first balloon ascended from the village of Annonay in France. It owed its inception to the genius of two brothers, paper-makers by trade, named Etienne and Joseph Montgolfier. Struck by the sight of smoke ascending from a chimney, after many failures with flapping-wing models, they conceived the idea of filling a receptacle with smoke and seeing if it would rise. They built a balloon or "globe" of paper and canvas, and lit a fire of wood and straw below the aperture in it. The balloon gradually filled and rose into the air to a height reported to be 6000 feet, though this is probably an exaggeration. It remained in the air for ten minutes and landed 1½ miles away.

This was the forerunner of the "Montgolfières," or hot-air balloons, which are a feature of fêtes and Guy Fawkes' Day celebrations. It was followed by the sending up of a "Montgolfière" from Versailles on 18th Sept. of the same year, carrying a basket containing a sheep, a cock, and a duck. The first human beings to make an ascent were Pilâtre de Rozier and the Marquis d'Arlande, who went away from Paris on 21st Nov., 1783. They passed right over Paris, and were in the air for twenty-five minutes, during which time they replenished the fire suspended in a brazier below the neck of the balloon.

**The Hydrogen Balloon.** The real genesis of the balloon, or air-ship as we know it to-day, was due to the discovery of hydrogen as the lightest gas, which discovery was made in 1766 by an English chemist, Henry Cavendish. Various people claim the credit of having been the first to call attention to the possibilities of this gas for aerial navigation. In 1781 Dr. Joseph Black of Edinburgh suggested to his pupils that a thin bladder filled with "the inflammable gas" (hydrogen) would rise into the air, but it appears doubtful whether he ever actually made the experiment. Tiberius Cavallo the same year, before the Royal Society, demonstrated that soap-bubbles filled with hydrogen would rise and float in the air.

The honour of building the first hydrogen balloon belongs, however, to three Frenchmen—the brothers Robert, and Charles, a physicist. They sent up a hydrogen-filled balloon of varnished silk from the Champ de Mars, Paris, on 7th Aug., 1783. One of the Roberts and Charles themselves made the second human ascent in their balloon—the first in a hydrogen balloon as opposed to a Montgolfière (as above)—on 1st Dec. the same year. In 1784 the same Frenchmen constructed the first "air-ship" or navigable balloon to the order of



Wright's Biplane Glider

the Duc de Chartres (Philippe Egalité). The gas container of this was elongated in form, and it could be propelled to some small extent by means of oars, and steered by a rudder.

In the same year a French military officer, named Meusnier, produced a completely detailed design for an air-ship. This embodied the first suggestion of screw-propellers, to be worked by man-power, and also provided for a "ballonet" into which air could be driven to replace hydrogen lost owing to expansion during the ascent. Meusnier's design was the genesis of the modern non-rigid air-ship, all the essential features remaining. This air-ship was, however, never built.

The first ascent in the British Isles was made in a Montgolfière by James Tytler at Edinburgh, on 27th Aug., 1784, though he travelled only a few hundred yars. He was followed by Vincent Lunardi, an Italian, who ascended from the artillery ground in London three weeks later (Sept., 1784), landing near Ware in Hertfordshire. The first Channel crossing by air was made in a hydrogen balloon from Dover to Calais on 7th Jan., 1785, by Blanchard and Dr. Jeffries.

Subsequent developments in air-ships are due to the pioneer work of Giffard (1852) (the first steam-driven air-ship), Dupuy de Lôme (1872), the brothers Tissandier (electric propulsion) (1883), Rénard and Krebbs (1884), Wölfert (1897), Santos Du-

mont (1898-1905), Zeppelin (1900), Lebaudy (1903), Barton (English) (1905), Willows (English) (1910).

**Heavier-than-Air Machines.** In the meantime experimental work was being carried on by the exponents of the heavier-than-air school, who soon abandoned the flapping-wing principle and eventually evolved the modern aeroplane. The modern aeroplane was evolved from the brain of an Englishman, Sir George Cayley, who in 1809 contributed an article to *Nicholson's Journal* in which he outlined the outstretched wings, vertical and horizontal steering surfaces, screw-propeller, "explosion" motor and "stream-line" form of the modern aeroplane. In 1842 Henson and Stringfellow, both Englishmen, constructed a steam-driven model on this principle, which is now in the South Kensington Museum. Wenham in 1866 contributed a valuable paper to the Royal Aeronautical Society on the subject.

In 1896 Lillienthal in Germany carried out a number of glides with rigid wings, provided with a movable tail, fixed to his body. He was followed by Chanute, who in America emphasized the biplane principle in his glider. In 1896 Ader, a Frenchman, built an "avion" which is claimed to have risen from the ground at Satory, but this is doubtful. In 1895 a huge steam-propelled aeroplane built by Sir Hiram Maxim burst the rails holding it down and lifted for a few feet.

The real credit for the evolution of a man-carrying aeroplane is, however, due to the American brothers Wilbur and Orville Wright of Dayton, Ohio. Encouraged by the advice of Chanute, they commenced experimenting with biplane gliders on the sand-hills at Kittyhawk. Meeting with considerable success, they fitted a petrol motor of their own design in 1903 and made several straight flights during the same year. In 1904 they succeeded in making the first turn in the air. Their first public flights were made in France in 1908. The first aviator to fly in Europe was Santos Dumont, who, on 12th Nov., 1906, covered 220 metres, having previously in the same year flown for shorter distances. At this time and during the two or three ensuing years many experiments were carried out, and flights made, by Farman, Voisin, Esnault-Pelterie, and Blériot in France; Wright and Curtiss in America; and Roe, Ogilvie, and Moore-Brabazon in England.

The second crossing of the Channel, and the first by a "heavier-than-air" machine, was effected by Louis Blériot on 25th July, 1909. From that date the science of aviation has rapidly advanced, especially during, and since, the European War. The North Atlantic has been crossed in both directions several times by aeroplane—the first non-stop crossing being made by Alcock and Brown in 1919. Colonel Lindbergh made the first solo flight across the the Atlantic from west to east in 1927, and in 1932 J. A. Mollison made the first solo crossing from east to west. The South Atlantic has been flown in both directions. (*See also* AIRSHIPS.) Several American pilots have made a complete circuit of the world. An aeroplane crossed the North Pole in 1926, and many notable flights have been made to Cape Town and to Australia by such pilots as Sir Alan Cobham, Miss Amy Johnson (Mrs. J. A. Mollison), and J. A. Mollison. In 1933 an R.A.F. machine flew non-stop from England to S.W. Africa. The altitude record (made in 1932) is 43,976 feet.

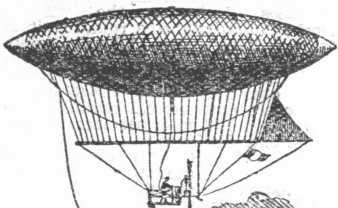
There are several important annual air-races, including the "Aerial Derby" and the race round Britain for the King's Cup. The Schneider Cup for scaplanes was won by Britain in 1931, the winner setting up a record speed over 218 miles of 388.67 m.p.h. There are now several regular long-distance aerial mail services, e.g. to India and the Cape.

In Great Britain the chief society is the Royal Aeronautical Society at 7 Albemarle Street, London, W. There is an Institute of Aeronautical Engineers at 60 Chancery Lane, London, W.C., and a paper, *The Aeroplane*, is published in the interests of the science. International flying is controlled by the *Federation Internationale Aeronautique*.—BIBLIOGRAPHY: Santos Dumont, *My Airships*; *The Aeronautical Classics* (Aeronautical Society); A. Berget, *The Conquest of the Air*.

**AEROPLANE.** A flying-machine deriving its power of sustentation from the reaction of the air driven downwards by the rapid transit of fixed wings or "planes" through the air. The term "plane" for the wing of an aeroplane is strictly a misnomer, as the word implies a flat plate, whereas a wing is "cambered" or curved in section from front to back. This is due to the discovery of Lillienthal (*see* AERONAUTICS) that a cambered "aerofoil" when set at an angle to a wind current gives more "lift" than a flat plane.

**Construction.** The wing of an aeroplane is normally set at an angle horizontally (or rather at an angle to the relative wind) varying from 0° to 4°. This angle is known as the "angle of incidence." As the wing is driven through the air under the in-

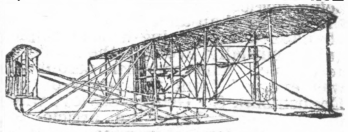
fluence of the propeller, the air meets the "leading" or "entering" edge and is divided into two streams along the top and bottom surfaces. It does not, however, follow the surface closely, but in the case of the lower stratum is deflected downwards at an angle to the surface, which results in an upward reaction. The upper of the two streams of air is correspondingly deflected upwards at an angle to the surface for a short distance. This causes an "area of discontinuity of flow," or eddy, which results in "negative pressure," causing an upward suction. This fact was first discovered by Sir Hiram Maxim, though it was G. Eiffel who measured the effects of the positive pressure on the lower surface and the negative pressure on the upper surface, and found, contrary to all expectation, that the latter is responsible for three-quarters of the total lifting effect of the wing.



Giffard's steam-driven Air-ship

In addition to the lift, the wings offer resistance to progress through the air, which effect is known as "drag." The ratio of lift to drag is a measure of the efficiency of a wing-section. A well-designed wing will have a L/D ratio at an angle of incidence of 4° of about 16, i.e. the lift effect in pounds will be 16 times that of the drag. The fundamental equation of an aeroplane is $R = KSV^2$, where R = the resistance, K = a constant (usually 0.003), S = area of surface, and V = the velocity in feet per second. From this it will be seen that the resistance for the same area increases as the square of the speed, which shows the importance of reducing the resistance to the lowest possible degree if high speeds are to be obtained.

For this purpose it is necessary that the flow of air round the component parts of the aeroplane caused by its passage should be as little disturbed and broken up into eddies as possible. It is found that the best theoretical shape for this purpose is a body of circular cross-section tapering from front to rear, with the maximum cross-section toward the *front*. The "fineness ratio" (ratio of length to maximum diameter) should be about 6 to 1, and the maximum cross-section



Wright Biplane (1908)

situated about one-third of the distance from the nose. Such a form will offer only about 1/20 the resistance of a flat plate of similar cross-section, and is known as a "streamline form."

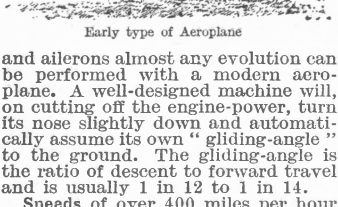
The width of a wing from side to side at right angles to the wind is known as the "span," and the breadth from front to back as the "chord." The ratio of span to chord is the "aspect ratio." Owing to the increase in drag resulting from low aspect ratio (large chord relative to span) the higher the aspect ratio the more efficient the wing. This is in practice about 6, owing to structual difficulties in constructing a wing of larger relative span.

**Component Parts.** The essential parts of an aeroplane are the wings, fuselage (body), tail (comprising fixed vertical and horizontal surfaces behind which are hinged movable rudders and elevators), and chassis, or landing-carriage. The majority of modern machines are biplanes, i.e. with one set of wings superposed on the other and connected by upright wooden members called "struts." Aeroplanes with one set of wings only are called "monoplanes;" those with three, "triplanes;" with four, "quadruplanes;" and with more than four, "multiplanes." Aeroplanes are also divided into "tractor" and "pusher," according to whether the propeller is situated in front or rear of the wings.

Blériot Monoplane (1909)

When the engine is started, the revolution of the propeller causes the aeroplane to move along the ground until such a speed is reached (usually about 35-50 miles per hour) that it is able to support its own weight in the air when it leaves the ground. When in the air it is made to ascend or

descend by moving the elevators, which are operated by a vertical stick in front of the pilot through control cables or levers. Steering to right or left is effected by the rudder, which is operated by a foot-bar through cables or levers. Lateral balance is obtained by means of "ailerons" or flaps on the outer extremities of the wings. If one wing tends to dip, the aileron on that side is depressed. This increases the resistance of that wing and so causes it to rise. By a combination of movements of the elevators, rudder,



Early type of Aeroplane

and ailerons almost any evolution can be performed with a modern aeroplane. A well-designed machine will, on cutting off the engine-power, turn its nose slightly down and automatically assume its own "gliding-angle" to the ground. The gliding-angle is the ratio of descent to forward travel and is usually 1 in 12 to 1 in 14.

**Speeds** of over 400 miles per hour have been attained by seaplanes and a height of over 43,000 feet has been reached. In 1933 an R.A.F. machine flew non-stop from England to S.W. Africa, a distance of 5341 miles, in 57 hours 25 minutes. Aeroplanes range in size from small single-seater "scouts" with a duration of only some three hours, to large multiple-engined machines with a weight, fully loaded, of from 15 to 20 tons. The essential feature of the aeroplane is, as already stated, that it is heavier than air and therefore subject to the laws of gravity in the event of engine failure. Its choice of a landing-ground is then dependent upon its height at the moment and gliding-angle.

Aeroplanes are normally constructed throughout of wood, though steel is occasionally used. The wings are built of wooden "spars," of which there are usually two along the length of each wing, connected together by wooden "ribs." The wings of a biplane are braced by the struts (*see above*) and by wires. "Landing-wires" support the weight of the wing on the ground, while "flying-wires" prevent them folding upwards under the influence of the lift in flight. "Drift-wires" are to prevent the wings folding backwards under the pressure of the air in flight. *See also* AERONAUTICS, SEAPLANES.—BIBLIOGRAPHY: H. Barber, *The Aeroplane Speaks*; H. Barber, *Aerobatics*; Hamel and Turner, *Flying*; Borlase Mathews, *Aviation Pocket Book*; Pippard and Pritchard, *Aeroplane Structures*; Judge, *Design of Aeroplanes*; Judge, *Properties of Aerofoils*; Loening, *Military Aeroplanes*.

**AEROSTATIC PRESS.** A contrivance for extracting the colouring matter from dye-woods and for similar purposes. A liquid intended to carry with it the extract is brought into contact with the substance containing it, and a vacuum being made by an air-pump suitably applied, the pressure of the atmosphere forces the liquid through the intervening mass, carrying the colour or other soluble matter with it.

**AEROSTAT'ICS.** That branch of physics which treats of the weight, pressure, and equilibrium of air and gases. *See* AIR; AIR-PUMP; BAROMETER; GASES, PROPERTIES OF; HYDROSTATICS; METEOROLOGY; ETC.

**AEROTHERAPEUTICS.** Is the treatment of disease by atmospheres artificially prepared and differing from the normal in compression or pressure or temperature. It is divided into:

**1. Medical atmospheres** artificially produced by changing the proportions of the normal gases of the atmosphere, or by adding gases to the atmosphere. These are applied by inhalation in various ways:

(*a*) By the inhalation of gases—*ether*; *chloroform*; *nitrous oxide* (*see* ANÆSTHETICS). *Oxygen* under pressure in a cylinder, with outlet applied close to the patient's mouth and nose, is used in severe cases of pneumonia, cardiac disease, or wherever breathing is difficult. *Amyl nitrate* is inhaled on the breaking of the glass capsules in which it is contained close to the patient's mouth; this treatment is used in cardiac disease and other conditions to recover blood pressure. *Chlorine* and *iodine* are used in cases of throat and bronchial affections by inhaling the vapour itself for a short time, or by inhaling air strongly impregnated with the substance.

(*b*) By inhalation of substances requiring heat for volatilization, e.g. *mercury* and *sulphur*. The patient, enveloped in a sheet, sits on a chair, while the substance, placed in a vessel on the floor inside the enveloping sheet near the patient, is heated by a spirit lamp or similar method. *Mercury* is used for chronic and syphilitic laryngitis and pharyngitis; *sulphur* for scabies and other skin diseases.

(*c*) By inhalation of steam or warm-water vapour with a drug added. Apparatus of various kinds is used,

the simplest of which is a wide-mouthed jug filled with boiling water to which the drug has been added. The patient takes a deep breath, drawing the vapour into his mouth up a napkin arranged in the form of a tube. More complicated forms of apparatus are steam-sprays and nebulizers for laryngeal and bronchial troubles.

(*d*) Cold medicated sprays and inhalations. Throat- and nose-sprays are much used, also sprays for the administration of local anæsthetics (ethyl chloride). Respirators are made of wire gauze with cotton wool or a sponge; the substance is poured on and inhaled by the patient.

For (*c*) and (*d*) the following drugs are used: carbolic acid, creosote, terebine, thymol, eucalyptol, zinc sulphate, in phthisis and bronchial affections; and eusol, izal, lysol, etc., for disinfection and fumigation.

**2. Changes produced by variation in barometric pressure considered in treatment of disease:**

Normal barometric pressure at sea-level, 29-30 inches; at Davos (5200 feet), 25 inches; at summit of Pike's Peak, Colorado (14,000 feet), 17½ inches; in balloon ascent (Glaisher and Coxwell) of 29,000 feet, 9¾ inches.

The effects of high pressure are seen in divers, caisson workers, miners. the effects of low pressure are seen in balloonists, airmen. The effect of sudden return to normal from high pressure is seen in cases of caisson disease (q.v.). The effects of low pressure were first applied to the human body in 1835 by V. T. Junot. He contrived a hollow copper ball, 4 yards in diameter, capable of containing a man, and by pumping out air gradually, produced the effects of low pressure. This principle was then applied by him locally by cupping-glasses similar in shape to the upper part of a wine-glass. There are two types of cupping:

(*a*) In *wet cupping* an incision is made in the skin of the part to be treated. The air inside the glass is exhausted by introducing a lighted match, then the open end of the glass is immediately applied to the surface of the skin.

(*b*) In *dry cupping* the treatment is similarly carried out, but no incision is made.

The low pressure (partial vacuum) draws blood to the part. Cupping is used in congestion of internal organs, e.g. lungs, kidneys.

The artificial application of air to lungs at varying pressure is carried out by inspiring rarefied air or compressed air and expiring into rarefied air or into compressed air. Only inspiring compressed air, or expiring into rarefied air, can be practically applied. There are many kinds of apparatus for this. The best is the compressed-air bath (seen at Brompton Hospital, London), consisting of three parts—the engine, receiver, and air-chamber.

The patient is placed in this air-chamber, where he remains for two hours, during which time the pressure is usually raised from half again to double normal. For the first half-hour the pressure is gradually raised, and is maintained at the same abnormal height for one hour; for the last half-hour it is reduced again gradually to normal. The patient first experiences an unpleasant sensation in the throat. This is relieved by swallowing or by drinking water; then pain in the ear-drums; the voice becomes shriller. These are early signs of the effects of high pressure, and are seen to a more marked degree in cases where a man has descended suddenly into a mine, caisson, etc. Compressed air-baths are used in cases of asthma, bronchitis, emphysema, anæmia.

**Respiratory gymnastics** are of value for defective breathing due to badly formed chests or injury and disease of the lungs. There are various forms of artificial breathing exercises and many ways of using artificial aids, e.g. breathing into bottles connected together by tubes and partly filled with water. The water is forced from one bottle to another by the respiratory effort of the patient.

**AERSCHOT.** Town in Belgium, province of Brabant, on the Demer, a tributary of the Dyle. It was occupied by the Germans in Aug., 1914. Pop. 8000.

**ÆSCHINES** (es'ki-nēz). A celebrated Athenian orator, the rival and opponent of Demosthenes, was born in 389 B.C. and died in 314. He headed the Macedonian party in Greece, or those in favour of an alliance with Philip, while Demosthenes took the opposite side. Having failed in 330 B.C. in a prosecution against Ctesiphon for proposing to bestow a crown of gold upon Demosthenes for his services to the State (whence the oration of Demosthenes "On the Crown") he left Athens, and subsequently established a school of eloquence at Rhodes. Three of his orations are extant. Æschines should not be confounded with his namesake, the Athenian philosopher and intimate friend of Socrates.

**ÆSCHYLUS** (es'ki-lus). The first in time of the three great tragic poets of Greece, born at Eleusis, in Attica, 525 B.C., died in Sicily 456. Before he gained distinction as a dramatist he

had fought at the battle of Marathon (490), as he afterwards did at Artemisium, Salamis, and Platæa. He first gained the prize for tragedy in 484 B.C. *The Persians*, the earliest of his extant pieces, formed part of a trilogy which gained the prize in 472 B.C. In 468 B.C. he was defeated by Sophocles, and then is said to have gone to the Court of Hiero, King of Syracuse.

Altogether he is reputed to have composed ninety plays and gained thirteen triumphs. Only seven of his tragedies are extant: *The Persians*, *Seven against Thebes*, *Suppliants*, *Prometheus*, *Agamemnon*, *Choephori*, and *Eumenides*, the last three forming a trilogy on the story of Orestes, represented in 458 B.C. Æschylus may be called the creator of Greek tragedy, both from the splendour of his dramatic writings and from the scenic improvements and accessories he introduced. Till his time only one actor had appeared on the stage at a time, and by bringing on a second he was really the founder of dramatic dialogue. His style was grand, daring, and full of energy, and his choruses, though difficult, are among the noblest pieces of poetry in the world. His plays have little or no plot, and his characters are drawn by a few powerful strokes.

There are English poetical translations of his plays by Blackie, Plumptre, Swanwick, Campbell, Robert Browning, and Elizabeth Barrett Browning.—BIBLIOGRAPHY: Bishop Copleston, *Æschylus*, in English Classics for Modern Readers Series (Blackwood & Son); Miss J. Case, Translation of *Prometheus Vinctus* (Dent).

**ÆSCULA'PIUS** (Gr. *Asklēpios*). The god of medicine among the Greeks and afterwards adopted by the Romans, usually said to have been a son of Apollo and the nymph Coronis. He was worshipped in particular at Epidaurus, in the Peloponnesus, where a temple with a grove was dedicated to him. The sick who visited his temple had to spend one or more nights in the sanctuary, after which the remedies to be used were revealed in a dream. Those who were cured offered a sacrifice to Æsculapius, commonly a cock. He is often represented with a large beard, holding a knotty staff, round which is entwined a serpent, the serpent being specially his symbol. The staff and serpent have been adopted as a badge by the Royal Army Medical Corps. Sometimes Æsculapius is represented under the image of a serpent only.—BIBLIOGRAPHY: L. Dyer, *The Gods of Greece*; W. H. D. Rouse, *Greek Votive Offerings*.

**ÆS'CULUS.** The genus of plants to which belongs the horse-chestnut.

**ÆSIR.** In Scandinavian mythology, the eleven chief gods, besides Odin. They are: Thor, Balder, Ty or Tyr, Bragi, Heimdal, Hod, Vidar, Vali, Ull, Forseti, and Loki or Lopt. *See* NORTHERN MYTHOLOGY.

**Æ'SOP.** The Greek fabulist, is said to have been a contemporary of Crœsus and Solon, and thus probably lived about the middle of the sixth century (620-550) B.C. But so little is known of his life that his existence has been called in question. He is said to have been originally a slave, and to have received his freedom from a Samian master, Iadmon. He then visited the court of Crœsus, and is also said to have visited Pisistratus at Athens. Finally he was sent by Crœsus to Delphi to distribute a sum of money to each of the citizens. For some reason he refused to distribute the money, whereupon the Delphians, enraged, threw him from a precipice and killed him.

No works of Æsop are extant, and it is doubtful whether he wrote any. Bentley inclined to the supposition that his fables were delivered orally and perpetuated by repetition. Such fables are spoken of both by Aristophanes and Plato. Phædrus turned into Latin verse the Æsopian fables current in his day, with additions of his own. In modern times several collections claiming to be Æsop's fables have been published. Cf. J. Jacobs, *The Fables of Æsop*.

**ÆSTHET'ICS** (Gr. *aisthētikos*, pertaining to perception). The philosophy of the beautiful; the name given to the branch of philosophy or of science which is concerned with that class of emotions, or with those attributes, real or apparent, of objects generally comprehended under the term *beauty*, and other related expressions. The term æsthetics first received this application from Baumgarten (1714-62), a German philosopher, who was the first modern writer to deal systematically with the subject, though the beautiful had received attention at the hands of philosophers from early times.

**Ancient Ideas.** Socrates, according to Xenophon, regarded the beautiful as coincident with the good, and both as resolvable into the useful. Plato, in accordance with his idealistic theory, held the existence of an absolute beauty, which is the ground of beauty in all things. He also asserted the intimate union of the good, the beautiful, and the true.

Aristotle treated of the subject in much more detail than Plato, but chiefly from the scientific or critical

point of view. In his treatises on *Poetics* and *Rhetoric* he lays down a theory of art, and establishes principles of beauty. His philosophical views were in many respects opposed to those of Plato. He does not admit an absolute conception of the beautiful; but he distinguishes beauty from the good, the useful, the fit, and the necessary. He resolves beauty into certain elements, as order, symmetry, definiteness. A distinction of beauty, according to him, is the absence of lust or desire in the pleasure it excites. Beauty has no utilitarian or ethical object; the aim of art is merely to give immediate pleasure; its essence is imitation. Plotinus agrees with Plato, and disagrees with Aristotle, in holding that beauty may subsist in single and simple objects, and consequently in restoring the absolute conception of beauty. He differs from Plato and Aristotle in raising art above nature.

**Modern Ideas.** Baumgarten's treatment of æsthetics is essentially Platonic. He made the division of philosophy into logic, ethics, and æsthetics; the first dealing with knowledge, the second with action (will and desire), the third with beauty. He limits æsthetics to the conceptions derived from the senses, and makes them consist in confused or obscured conceptions, in contradistinction to logical knowledge, which consists in clear conceptions. Kant, in his *Critique of the Power of Judgment*, defines beauty in reference to his four categories, quantity, quality, relation, and modality. In accordance with the subjective character of his system he denies an absolute conception of beauty, but his detailed treatment of the subject is inconsistent with the denial. Thus he attributes a beauty to single colours and tones, not on any plea of complexity, but on the ground of purity. He holds also that the highest meaning of beauty is to symbolise moral good, and arbitrarily attaches moral characters to the seven primary colours. The value of art is mediate, and the beauty of art is inferior to that of nature. The treatment of beauty in the systems of Schelling and Hegel could with difficulty be made comprehensible without a detailed reference to the principles of these remarkable speculations.

**English Writers on Æsthetics.** English writers on beauty are numerous, but they rarely ascend to the heights of German speculation. Shaftesbury adopted the notion that beauty is perceived by a special internal sense; in which he was followed by Hutcheson, who held that beauty existed only in the perceiving mind, and not in the object. Numerous English writers, among whom the principal are Alison and Jeffrey, have supported the theory that the source of beauty is to be found in association—a theory analogous to that which places morality in sympathy. The ability of its supporters gave this view a temporary popularity, but its baselessness has been effectively exposed by successive critics. Dugald Stewart attempted to show that there is no common quality in the beautiful beyond that of producing a certain refined pleasure; and Bain agrees with this criticism, but endeavours to restrict the beautiful within a group of emotions chiefly excited by association or combination of simpler elementary feelings.

Herbert Spencer has a theory of beauty which is subservient to the theory of evolution. He makes beauty consist in the play of the higher powers of perception and emotion, defined as an activity not directly subservient to any processes conducive to life, but being gratifications sought for themselves alone. He classifies æsthetic pleasures according to the complexity of the emotions excited, or the number of powers duly exercised; and he attributes the depth and apparent vagueness of musical emotions to associations with vocal tones built up during vast ages. Among numerous writers who have made valuable contributions to the scientific discussion of æsthetics may be mentioned Winckelmann, Lessing, Richter, the Schlegels, Gervinus, Helmholtz, Ruskin, Home, Hogarth, Burke, Taine, and others.—BIBLIOGRAPHY: Herbert Spencer, *Principles of Psychology*; Grant Allen, *Physiological Æsthetics*; A. Bain, *Emotions and Will*; B. Bosanquet, *History of Æsthetics*; W. Knight, *Philosophy of the Beautiful*.

**ÆSTIVA'TION.** A botanical term applied to the arrangement of the parts of a flower in the flower-bud previous to the opening of the bud.—The term is also applied to the summer sleep of animals. *See* DORMANT STATE.

**ÆTH'ELING.** *See* ATHELING.

**Æ'THER.** *See* ETHER.

**ÆTHIO'PIA.** *See* ETHIOPIA.

**Æ'THRIOSCOPE** (Gr. *aithrios*, clear, cloudless). An instrument (devised by Sir John Leslie) for measuring radiation towards a clear sky, consisting of a metallic cup with a highly-polished interior of paraboloid shape, in the focus of which is placed one bulb of a differential thermometer, the other being outside.

The inside bulb at once begins to radiate heat when exposed to a clear sky, and the extent to which this takes place is shown by the scale of the thermometer. The æthrioscope also indicates the presence of invisible aqueous vapour in the atmosphere, radiation being less than when the air is dry.

**AË'TIUS.** A general of the western Roman Empire, born A.D. 396; murdered 454. As commander in the reign of Valentinian III. he defended the empire against the Huns, Visigoths, Franks, Burgundians, etc., completely defeating the Huns under Attila in a great battle at Châlons in 451. For twenty years he was at the head of public affairs, and in the end was murdered by Valentinian, who was jealous of his power.

**ÆT'NA.** *See* ETNA.

**ÆTO'LIA.** A western division of northern Greece, separated on the west by the Achelous from Acarnania and washed by the Corinthian Gulf on the south. The inhabitants are little heard of in Greek history till the Peloponnesian war, at which time they were notorious among the Greeks for the rudeness of their manners. Ætolia, in conjunction with Acarnania, now forms a nomarchy of the kingdom of Greece.

**AFANASIEV, Alexander Nicolaievitsh.** Russian folklorist, born in 1826. Besides numerous articles and essays he wrote several monumental works: *The Ancient Slav's Poetic View of Nature* (3 vols., 1866-9), *Russian Tales and Fables for Children* (3 vols., 1870), etc. He died in 1871.

**AFFIDA'VIT.** A written statement of facts upon oath or affirmation. Affidavits are generally made use of when evidence is to be laid before a judge or a court, while evidence brought before a jury is delivered orally. The person making the affidavit signs his name at the bottom of it, and swears that the statements contained in it are true. The affidavit may be sworn to in open court, or before a magistrate or other duly qualified person; it may be made abroad before a qualified British state official.

**AFFIN'ITY.** In chemistry, the force by which unlike kinds of matter combine so intimately that the properties of the constituents are lost, and a compound with new properties is produced. Of the force itself we know little or nothing. It is not the same under all conditions, being very much modified by circumstances, especially temperature. The usual effect of increase of temperature is to diminish affinity and ultimately to cause the separation of a compound into its constituents; and there is probably for every compound a temperature above which it could not exist, but would be broken up. Where two elements combine to form a compound, heat is almost always evolved, and the amount evolved serves as a measure of the affinity. In order that chemical affinity may come into play it is necessary that the substances should be in contact, and usually one of them at least is a fluid or a gas. The results produced by chemical combination are endlessly varied. Colour, taste, and smell are changed, destroyed, or created; harmless constituents produce strong poisons, strong poisons produce harmless compounds.

**AFFINITY.** In law, is that degree of connection which subsists between one of two married persons and the blood relations of the other. It is no real kindred (consanguinity). A person cannot, by legal succession, receive an inheritance from a relation by affinity; neither does it extend to the nearest relations of husband and wife so as to create a mutual relation between them. The degrees of affinity are computed in the same way as those of consanguinity or blood. All legal impediments arising from affinity cease upon the death of the husband or wife, excepting those which relate to the marriage of the survivor.

**AFFIRMA'TION.** A solemn declaration by Quakers, Moravians, Dunkers, and others, who object to taking an oath, in confirmation of their testimony in courts of law, or of their statements on other occasions on which the sanction of an oath is required of other persons. In England the form for Quakers is, "I do solemnly, sincerely, and truly declare and affirm." Affirmation is generally allowed to be substituted for an oath in all cases where a person refuses to take an oath from conscientious motives, if the judge is satisfied that the motives are conscientious.

**AFFORESTATION.** Planting new forests. It should be distinguished from forestry, which is the care of the trees. Afforestation may be undertaken to replace trees cut down, to provide timber, or to improve the climatic or æsthetic conditions of a district.

Afforestation in Britain, formerly left to private enterprise, is now supervised by the Forestry Commission. This body has planted 185,000 acres in Great Britain, including a considerable area called Breckland on the borders of Norfolk and Suffolk, and large tracts in the Highlands of

Scotland. The trees chiefly planted are spruce, larch fir, and other coniferous trees, which grow much more quickly than do oaks and elms. *See* FORESTRY.

**AFFREIGHTMENT.** Is a contract for the carriage of goods by sea, by which the shipowner agrees to carry them for hire or "freight." The terms of such a contract before the Carriage of Goods by Sea Act, 1924, were to be found in a charter-party and/or in a bill of lading. A charter-party is an agreement by which the charterer hires from the shipowner the use of a ship for a certain voyage or for a certain time. The master and crew are almost always the owner's servants, but it is stipulated that they must comply with the directions of the charterer within the scope of the charter-party, e.g. as to receiving and stowing the cargo and delivering it at the ports specified by him. So it is also provided that the master shall sign bills of lading.

A bill of lading is the ship's receipt for goods described in it which have already been shipped, and it has hitherto set out the various conditions of transit. The owner by endorsement and delivery of it can transfer the property in the goods and (by a statute of 1854) all the contractual rights and liabilities of the original consignor to the transferee. Practically all overseas trade is financed by bankers' advances on bills of lading, and the obvious desirability of uniformity in their conditions contributed to the passing of the Carriage of Goods by Sea Act, 1924, which contains rules governing every bill of lading issued in Great Britain and Northern Ireland and the liabilities and rights of the carrier. These rules apply to every kind of goods except (i) live animals, (ii) cargo which is stated as being carried on deck, and is so carried, and (iii) goods in the coasting trade between any ports in Great Britain or Ireland.

But shipments which are not commercial or in the ordinary course of trade *and* are made under such circumstances as reasonably to justify a special agreement are still permitted if the agreement is stated in a receipt which is a non-negotiable document and must be marked as such. No bill of lading can be issued in this case. The rules are too elaborate for statement here, but their main general effects are (i) to insist that the carrier exercise due diligence, and (ii) to make the carrier liable only for some want of diligence by himself or his agents or servants. But the carrier may alter these conditions against himself by the terms of the bill of lading. *See* BILL OF LADING.

**AFFRIQUE** (åf-rēk), **ST.** A town of southern France, department of Aveyron.

**AFGHANISTAN** (åf-găn'i-stăn). That is, the land of the Afghans, a country in Asia, bounded on the east by the N.W. Frontier Province, etc., on the south by Baluchistan, on the west by the Persian province of Khorasan, and on the north by Bukhara and Russian Turkistan. The eastern and southern boundaries were settled between 1893 and 1919, whilst the boundary towards Persia was demarcated between 1903 and 1905. The area may be set down at about 245,000 sq. miles. The population is estimated at 11,000,000.

**Physical Features.** Afghanistan consists chiefly of lofty, bare, uninhabited tablelands, sandy barren plains, ranges of snow-covered mountains, offsets of the Hindu Kush or the Himalaya, and deep ravines and valleys. Many of the last are well watered and very fertile, but about four-fifths of the whole surface is rocky, mountainous, and unproductive. The surface on the north-east is covered with lofty ranges belonging to the Hindu Kush, whose heights are often 18,000 and sometimes reach perhaps 25,000 feet. The whole north-eastern portion of the country has a general elevation of over 6000 feet; but towards the south-west, in which direction the principal mountain chains of the interior run, the general elevation declines to not more than 1600 feet. In the interior the mountains sometimes reach the height of 15,000 feet. Great part of the frontier towards India consists of the Suleiman range, 12,000 feet high.

There are numerous practicable avenues of communication between Afghanistan and India, among the most extensively used being the famous Khyber Pass, by which the River Kabul enters the Punjab; the Gomul Pass, also leading to the Punjab; and the Bolan Pass on the south, through which the route passes to Sind. Of the rivers the largest is the Helmund, which flows in a south-westerly direction more than 400 miles, till it enters the Hamoon or Seistan swamp. It receives the Arghandab, a considerable stream. Next in importance are the Kabul in the north-east, which drains to the Indus, and the Hari Rud in the north-west, which, like other Afghan streams, loses itself in the sand.

**Flora and Fauna.** The climate is extremely cold in the higher, and intensely hot in the lower regions, yet on the whole it is salubrious. The most common trees are the pine, oak, birch, and walnut. In the valleys

fruits, in the greatest variety and abundance, grow wild. The principal crops are wheat (forming the staple food of the people), barley, rice, and maize. Other crops are tobacco, sugar-cane, and cotton. The chief domestic animals are the dromedary, the horse, ass, and mule, the ox, sheep with large fine fleeces and enormous fat tails, and goats; of wild animals there are the tiger, bears, leopards, wolves, jackal, hyena, foxes, etc.

**People.** The chief towns are Kabul (the capital), Kandahar, Ghuzni, and Herat. The inhabitants belong to different races, but the Afghans proper form the great mass of the people. They are allied in blood to the Persians, and are divided into a number of tribes, among which the Duranis and Ghiljis are the most important. The Afghans, claiming descent from King Saul, are called by their own ancient chroniclers Beni-Israel. They are bold, hardy, and warlike, fond of freedom, and resolute in maintaining it, but of a restless, turbulent temper, and much given to plunder. Tribal dissensions are constantly in existence, and seldom or never do all the Afghans pay allegiance to the nominal ruler of their country. Their language (Pushtu) is distinct from the Persian, though it contains a great number of Persian words, and is written, like the Persian, with the Arabic characters. In religion they are Mahommedans of the Sunnite sect.

**History.** After having been subjugated by Alexander the Great, the country of the Afghans fell successively under the sway, actual or nominal, of Parthians, Seleucidæ, Persians, and Arabs. Djinghiz Khan conquered Afghanistan in the twelfth century and Timur in the fourteenth. In 1504 Sultan Baber took Kabul and founded the Mogul dynasty in India; Afghanistan thus formed part of the great empire of Delhi. In 1738 the country was conquered by the Persians under Nadir Shah. On his death in 1747 Ahmed Shah, one of his generals, obtained the sovereignty of Afghanistan, and became the founder of a dynasty which lasted about eighty years.

At the end of that time Dost Mohammed, the ruler of Kabul, had acquired a preponderating influence in the country. On account of his dealings with the Russians the British resolved to dethrone him and restore Shah Shuja, a former ruler. In April, 1839, a British army under Sir John Keane entered Afghanistan, occupied Kabul, and placed Shah Shuja on the throne, a force of 8000 being left to support the new sovereign. Sir W. Macnaghten remained as envoy at Kabul, with Sir Alexander Burnes as assistant envoy.

The Afghans soon organised a widespread insurrection, which came to a head on 2nd Nov., 1841, when Burnes and a number of British officers, besides women and children, were murdered, Macnaghten being murdered not long after. The other British leaders now made a treaty with the Afghans, at whose head was Akbar, son of Dost Mohammed, agreeing to withdraw the forces from the country, while the Afghans were to furnish them with provisions and escort them on their way.

On 6th Jan., 1842, the British left Kabul and began their most disastrous retreat. The cold was intense, they had almost no food—for the treacherous Afghans did not fulfil their promises—and day after day they were assailed by bodies of the enemy. By the 13th 26,000 persons, including camp-followers, women and children, were destroyed. Some were kept as prisoners, but only one man, Dr. Brydon, reached Jelalabad, which, as well as Kandahar, was still held by British troops. In a few months General Pollock, with a fresh army from India, retook Kabul and soon finished the war. Shah Shuja having been assassinated, Dost Mohammed again obtained the throne of Kabul, and acquired extensive power in Afghanistan. He joined with the Sikhs against the British, but afterwards made an offensive and defensive alliance with the latter. He died in 1863, having nominated his son Shere Ali his successor.

Shere Ali entered into friendly relations with the British, but in 1878, having repulsed a British envoy and refused to receive a British mission (a Russian mission being meantime at his Court), war was declared against him, and the British troops entered Afghanistan. They met with comparatively little resistance; the Ameer fled to Turkistan, where he soon after died; and his son Yakoob Khan having succeeded him concluded a treaty with the British (at Gandamak, May, 1879), in which the control by Britain of the foreign policy of Afghanistan, and the residence of a British envoy in Kabul, were the chief stipulations.

Not long after this settlement, the British resident at Kabul, Sir Louis P. Cavagnari, and the other members of the mission were treacherously attacked and slain by the Afghans, and troops had again to be sent into the country. Yakoob Khan was sent to imprisonment in India. In 1880 Abdur-Rahman, a grandson of Dost Mohammed, was recognised by Britain as Ameer of the country.

He died in 1901, his son Habibullah being his successor. On 31st Aug., 1907, an Anglo-Russian Convention relating to Afghanistan was signed. In spite of German intrigues, the Ameer refused, in 1915, the inducements held out to him to abandon his British ally. He was assassinated on 20th Feb., 1919, and was succeeded by his third son Amanullah. The new Ameer sought to gain popularity with his subjects by embarking on an unprovoked war of aggression upon India. Hostilities ended with a peace treaty signed at Rawalpindi on 8th Aug., 1919.

In 1921 Britain recognised the independence of Afghanistan, and Afghanistan accepted the existing frontiers. In 1922 the first Afghan minister was appointed to London (instead of to Delhi), and in the same year the government became a constitutional monarchy, with Legislative and State Assemblies and a Cabinet presided over by the Ameer (who in 1926 assumed the title of King).

In 1927-8 King Amanullah and Queen Suraya visited the principal countries of Europe, and as a result Amanullah attempted to impose Western culture on Afghanistan. His tribesmen, however, revolted against his reforms in December, 1928, and attacked Kabul. Amanullah abdicated in favour of his brother Inayatullah, who in turn abdicated when Habibullah, a tribal chief, declared himself Ameer of Kabul. Amanullah returned in 1929, but a few months later he again abdicated and fled the country. Nadir Khan became king, and a period of more settled rule began.—BIBLIOGRAPHY: Malleson, *History of Afghanistan*; Forbes, *The Afghan Wars*; Field-Marshal Earl Roberts, *Forty-one Years in India*; J. G. Lyons, *Afghanistan: the Buffer State*.

**AF'RICA.** One of the three great divisions of the Old World, and the second in extent of the five principal continents of the globe, forming a vast peninsula joined to Asia by the Isthmus of Suez. It is of a compact form, with few important projections or indentations, and having therefore a very small extent of coast-line (about 16,000 miles, or much less than that of Europe) in proportion to its area. This continent extends from 37° 21′ N. lat. to 34° 51′ S. lat., and the extreme points, Cape Blanco and Cape Agulhas, are nearly 5000 miles apart. From west to east, between Cape Verde, lon. 17° 34′ W., and Cape Guardafui, lon. 51° 16′ E., the distance is about 4600 miles. The area is estimated at 11,500,000 sq. miles, or more than three times that of Europe. The islands belonging to Africa are not numerous, and, except Madagascar, none of them are large. They include Madeira, the Canaries, Cape Verde Islands, Fernando Po, Principe, São Thomé, Ascension, St. Helena, Mauritius, Réunion, the Comoros, Socotra, etc.

**Physical Features.** The interior of Africa is as yet imperfectly known, but we know enough of the continent as a whole to be able to point to some general features that characterise it. One of these is that almost all round it at no great distance from the sea, and, roughly speaking, parallel with the coast-line, we find ranges of mountains or elevated lands forming the outer edges of interior plateaux.

The most striking feature of Northern Africa is the immense tract known as the Sahara or Great Desert, which is enclosed on the north by the Atlas Mountains (greatest height, 12,000 to 15,000 feet), the plateau of Barbary and that of Barqa, on the east by the mountains along the west coast of the Red Sea, on the west by the Atlantic Ocean, and on the south by the Sudan. The Sahara is by no means the sea of sand it has sometimes been represented: it contains elevated plateaux and even mountains radiating in all directions, with habitable valleys between. A considerable nomadic population is scattered over the habitable parts, and in the more favoured regions there are settled communities.

The Sudan, which lies to the south of the Sahara, and separates it from the more elevated plateau of Southern Africa, forms a belt of pastoral country across Africa, and includes the countries on the Niger, around Lake Tchad (or Chad), and eastwards to the elevated region of Abyssinia.

Southern Africa as a whole is much more fertile and well watered than Northern Africa, though it also has a desert tract of considerable extent (the Kalahari Desert). This division of the continent consists of a tableland, or series of tablelands, of considerable elevation and great diversity of surface, exhibiting hollows filled with great lakes, and terraces over which the rivers break in falls and rapids, as they find their way to the low-lying coast tracts. The mountains which enclose Southern Africa are mostly much higher on the east than on the west, the most northerly of the former being those of Abyssinia, with heights of 10,000 to 14,000 or 16,000 feet, while the eastern edge of the Abyssinian plateau presents a steep unbroken line of 7000 feet in height for many hundred miles.

Farther south, and between the great lakes and the Indian Ocean, we

find Mounts Kenya and Kilimanjaro (19,324 feet), the loftiest in Africa, covered with perpetual snow. Of the continuation of this mountain boundary we shall only mention the Drakenberg Mountains, which stretch to the southern extremity of the continent, reaching, in Cathkin Peak, Natal, the height of over 10,000 feet. Of the mountains that form the western border the highest are the Cameroon Mountains, which rise to a height of 13,000 feet at the inner angle of the Gulf of Guinea. The average elevation of the southern plateau is from 3000 to 4000 feet.

The Nile is the only great river of Africa which flows into the Mediterranean. It receives its waters primarily from the great lake Victoria Nyanza, which lies under the equator, and in its upper course is fed by tributary streams of great size, but for the last 1200 miles of its course it has not a single affluent. It drains an area of more than 1,000,000 sq. miles.

The Physical Features of Africa and the Winds prevailing over the Oceans

The Indian Ocean receives numerous rivers; but the only great river of South Africa which enters that ocean is the Zambesi, the fourth in size of the continent, and having in its course the Victoria Falls, one of the greatest waterfalls in the world. In Southern Africa also, but flowing westward and entering the Atlantic, is the Congo, which takes

its origin from a series of lakes and marshes in the interior, is fed by great tributaries, and is the first in volume of all the African rivers, carrying to the ocean more water than the Mississippi. Unlike most of the African rivers, the mouth of the Congo forms an estuary. Of the other Atlantic rivers, the Senegal, the Gambia, and the Niger are the largest, the last being third among African streams.

With the exception of Lake Tchad there are no great lakes in the northern division of Africa, whereas in the number and magnificence of its lakes the southern division almost rivals North America. Here are the Victoria and Albert Nyanza, Lakes Tanganyika, Nyasa, Shirwa, Bangweulu, Moero, and other lakes. Of these the Victoria and Albert belong to the basin of the Nile; Tanganyika, Bangweulu, and Moero to that of the Congo; Nyasa, by its affluent the Shiré, to the Zambezi. Lake Tchad on the borders of the northern desert region is now known to be much smaller than was formerly believed, but varies in area according to the season. Lake Ngami in the far south is now a mere swamp.

**Climate.** The climate of Africa is mainly influenced by the fact that it lies almost entirely within the tropics. In the equatorial belt, both north and south, rain is abundant and vegetation very luxuriant, dense tropical forests prevailing for about 10° on either side of the line. To the north and south of the equatorial belt the rainfall diminishes, and the forest region is succeeded by an open pastoral and agricultural country. This is followed by the rainless regions of the Sahara on the north and the Kalahari Desert on the south, extending beyond the tropics, and bordering on the agricultural and pastoral countries of the north and south coasts, which lie entirely in the temperate zone. The low coast regions of Africa are almost everywhere unhealthy, the Atlantic coast within the tropics being the most fatal region to Europeans.

**Minerals, Flora and Fauna.** Among mineral productions may be mentioned gold, which is found in the rivers of West Africa (hence the name Gold Coast), and in Southern Africa, most abundantly in the Transvaal; diamonds have been found in large numbers in recent years in the south; iron, copper, lead, tin, and coal are also found.

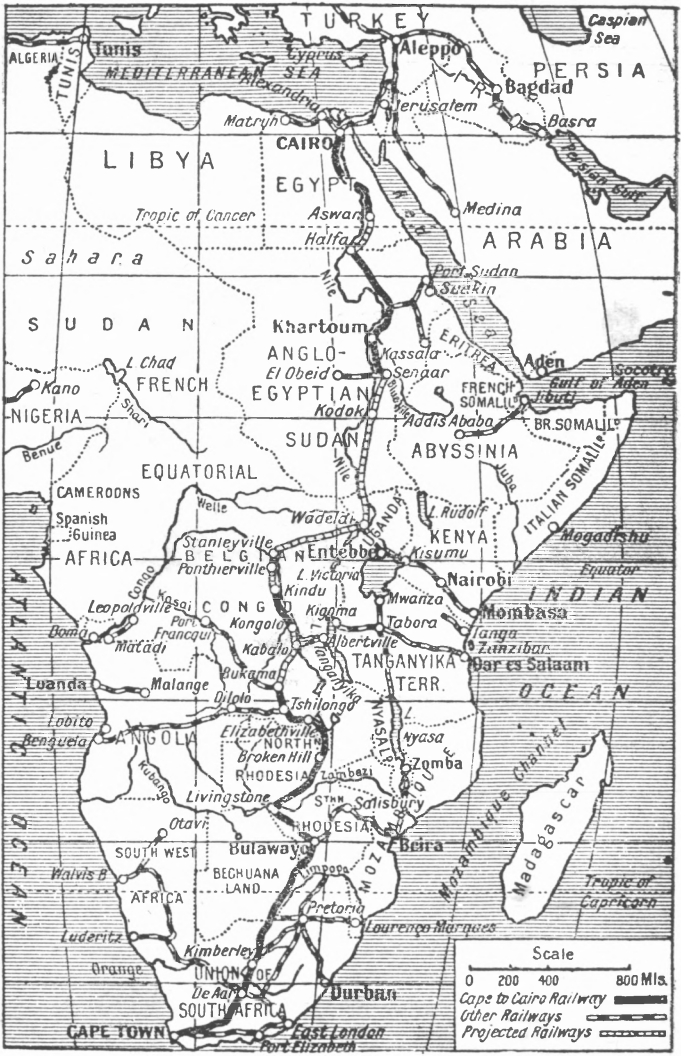
Among plants are the baobab, the date-palm (important as a food plant in the north), the doum-palm, the oil-palm, the wax-palm, the shea-butter tree, trees yielding caoutchouc, the papyrus, the castor-oil plant, indigo, the coffee-plant, heaths with beautiful flowers, aloes, etc. Among cultivated plants are wheat, maize, millet, and other grains, cotton, coffee, cassava, ground-nut, yam, banana, tobacco, various fruits, etc. As regards both plants and animals, Northern Africa, adjoining the Mediterranean, is distinguished from the rest of Africa in its great agreement with Southern Europe.

Among the most characteristic African animals are the lion, hyena, jackal, gorilla, chimpanzee, baboon, African elephant (never domesticated, yielding much ivory to trade), hippopotamus, rhinoceros, giraffe, zebra, quagga, antelopes in great variety and immense numbers. Among birds are the ostrich, the secretary-bird or serpent-eater, the honey-guide cuckoo, sacred ibis, guinea fowl. The reptiles include the crocodile, chameleon, and serpents of various kinds, some of them very venomous. Among insects are locusts, scorpions, the tsetse-fly whose bite is so fatal to cattle, and white-ants.

**People.** The great races of which the population of Africa mainly consists are the Eastern Hamites (who are not a distinct race but a blend), the Semites, the Negroes, and the Bantus. To the Semitic stock belong the Arabs, who form a considerable portion of the population in Egypt and along the north coast, while a portion of the inhabitants of Abyssinia is of the same race. The Hamites are represented, according to Sergi, by the Copts of Egypt, the Berbers, Kabyles, etc., of Northern Africa, and the Somâli, Danâkil, etc., of East Africa. The Negro races occupy a vast territory in the Sudan and Central Africa, while the Bantus occupy the greater part of Southern Africa from a short distance north of the equator, and include the Kaffirs, Bechuanas, Swahili, and allied races.

In the extreme south-west are the Hottentots and Bushmen (the latter a dwarfish race), distinct from the other races as well as, probably, from each other. In Madagascar there is a large Malay element. To these may be added the Fulahs on the Niger and the Nubians on the Nile and elsewhere, who are of a brownish colour, and are often regarded as distinct from the other races, though sometimes classed with the Negroes.

In religion a great proportion of the inhabitants are heathens of the lowest type; Mohammedanism numbers a large number of adherents in North Africa, and is rapidly spreading in the Sudan; Christianity prevails only among the Copts, the Abyssinians, and the natives of Mada-




AFRICA, SHOWING RAILWAYS

gascar, the last-named having been converted in recent times. Elsewhere the missionaries seem to have made but little progress.

Over a great part of the continent civilization is at a low ebb, yet in some parts the natives have shown considerable skill in agriculture and various mechanical arts, as in weaving and metal working. Of African trade two features are the caravans that traverse great distances, and the trade in slaves that still widely prevails, though it has been greatly restricted in recent years. Among articles exported from Africa are palm-oil, diamonds, ivory, ostrich feathers, wool, cotton, gold, esparto, caoutchouc, etc. The population is estimated at 160,000,000. Of these a small number are of European origin—French in Algeria and Morocco, British and Dutch at the southern extremity.

**Political Divisions.** Great areas in Africa have been apportioned among European Powers as protectorates or spheres of influence. The only independent states in Africa are Egypt, Abyssinia, and Liberia. The rest of the continent is divided amongst various European countries. Britain possesses or protects the Union of South Africa, Basutoland, Bechuanaland, Rhodesia, Swaziland, Nyasaland, Kenya, Uganda, British Somaliland, Sudan, Gambia, Sierra Leone, Gold Coast, and Nigeria. French interests are centred in Algeria, Tunis, Sahara, Senegambia, French Guinea, Dahomey, French Sudan, French Equatorial Africa, Madagascar, and French Somaliland. Portugal holds Portuguese Guinea, Angola, and Portuguese East Africa; and Spain has Rio de Oro and Rio Muni. Italy possesses Libya, Eritrea, and Italian Somaliland; and to Belgium belongs the Belgian Congo. The former German territories are now administered under mandates from the League of Nations: Togoland partly by the British, partly by the French; the Cameroons by the French; S.W. Africa by the Union; and German East Africa (now Tanganyika) by the British.

**Exploration.** The name Africa was given by the Romans at first only to a small district in the immediate neighbourhood of Carthage. The Greeks called Africa Libya, and the Romans often used the same name. The first African exploring expedition on record was sent by Pharaoh Necho about the end of the seventh century B.C. to circumnavigate the continent. The navigators, who were Phœnicians, were absent three years, and according to report they accomplished their object. Fifty or a hundred years later, Hanno, a Carthaginian, made a voyage down the west coast and seems to have got as far as the Bight of Benin. The east coast was probably known to the ancients as far as Mozambique and the island of Madagascar.

Of modern nations the Portuguese were the first to take in hand the exploration of Africa. In 1433 they doubled Cape Bojador, in 1441 reached Cape Blanco, in 1442 Cape Verde, in 1462 they discovered Sierra Leone. In 1484 the Portuguese Diego Cam discovered the mouth of the Congo. In 1486 Bartholomew Diaz rounded the Cape of Good Hope and reached Algoa Bay. A few years later a Portuguese traveller visited Abyssinia. In 1497 Vasco da Gama, who was commissioned to find a route by sea to India, sailed round the southern extremity as far as Zanzibar, discovering Natal on his way. The first European settlements were those of the Portuguese in Angola and Mozambique, soon after 1500. In 1650 the Dutch made a settlement at the Cape. In 1770 James Bruce reached the source of the Blue Nile in Abyssinia. For the exploration of the interior of Africa, however, little was done before the close of the eighteenth century.

Modern African exploration may be said to begin with Mungo Park, who reached the upper course of the Niger (1795-1805). Dr. Lacerda, a Portuguese, about the same time reached the capital of the Cazembe, in the centre of South Africa, where he died. During 1802-6 two Portuguese traders crossed the continent from Angola, through the Cazembe's dominions, to the Portuguese possessions on the Zambezi. During 1822-4 extensive explorations were made in Northern and Western Africa by Denham, Clapperton, and Oudney, who proceeded from Tripoli by Murzuq to Lake Tchad, and explored the adjacent regions; Laing, in 1826, crossed the desert from Tripoli to Timbuktu; Caillié, leaving Senegal, made in 1827-8 a journey to Timbuktu, and thence through the desert to Morocco. In 1830 Lander traced a large part of the course of the Niger downward to its mouth, discovering its tributary the Benue.

In the south Livingstone, who was stationed as a missionary at Kolobeng, setting out from that place in 1849 discovered Lake Ngami. In 1851 he went north again, and came upon numerous rivers flowing north, affluents of the Zambezi. In 1848 and 1849 Krapf and Rebmann, missionaries in East Africa, discovered the mountains Kilimanjaro and Kenya. An expedition sent out by the

British Government started from Tripoli in 1850 to visit the Sahara and the regions around Lake Tchad, the chiefs being Richardson, Overweg, and Barth. The last alone returned in 1855, having carried his explorations over 2,000,000 sq. miles of this part of Africa, hitherto almost unknown.

During 1853-6 Livingstone made an important series of explorations. He first went north-westwards, tracing part of the Upper Zambesi, and reached St. Paul de Loanda on the west coast in 1854. On his return journey he followed pretty nearly the same route till he reached the Zambesi, and proceeding down the river, and visiting its falls, called by him the Victoria Falls, he arrived at Quelimane at its mouth on 20th May, 1856, thus crossing the continent from sea to sea. In 1858 he resumed his exploration of the Zambezi regions, and in various journeys visited Lakes Shirwa and Nyasa, sailed up the Shiré to the latter lake, and established the general features of the geography of this part of Africa, returning to England in 1864.

By this time the great lakes of equatorial Africa were becoming known, Tanganyika and Victoria having been discovered by Burton and Speke in 1858, and the latter having been visited by Speke and Grant in 1862 and found to give rise to the Nile, while Lake Albert was discovered by Baker in 1864.

In 1866 Livingstone entered on his last great series of explorations, the main object of which was to settle the position of the watersheds in the interior of the continent, and which he carried on till his death in 1873. His most important explorations on this occasion were west and south-west of Tanganyika, including the discovery of Lakes Bangweulu and Moero, and part of the upper course of the River Congo (here called Lualaba). For over two years he was lost to the knowledge of Europe till met with by H. M. Stanley at Tanganyika in 1871.

Gerhard Rohlfs, in a succession of journeys from 1861 to 1874, traversed the Sahara in different directions, and also crossed the continent entirely from Tripoli to Lagos by way of Murzuq, Bornu, etc. During 1873-5 Lieutenant Cameron, who had been sent in search of Livingstone, surveyed Lake Tanganyika, explored the country to the west of it, and then travelling to the south-west, finally reached Benguella on the Atlantic coast. During 1874-7 Stanley surveyed the great Lakes Victoria and Tanganyika and explored the intervening country; then going westward to where Livingstone had struck the Congo he followed the river down to its mouth, thus finally settling its course and completing a remarkable and valuable series of explorations. In 1879 Serpa Pinto completed a journey across the continent from Benguella to Natal, and in 1881-2 Wissman and Pogge crossed it again from St. Paul de Loanda to Zanzibar.

In recent years our knowledge of all parts of Africa has been greatly increased, thanks to the efforts of travellers, missionaries, and commercial agents. Steamers now ply on the Congo, and on Lakes Tanganyika, Nyasa, and Victoria, and numerous railways ("Cape to Cairo," etc.) extend far into the continent and telegraphic communication has been greatly extended; wireless stations have been erected, as a result of the great strides made in wireless telegraphy during the Great War.—BIBLIOGRAPHY: Mungo Park, *Travels*; D. Livingstone, *Missionary Travels*; Sir H. M. Stanley, *In Darkest Africa*; Sir H. H. Johnston, *Africa*.

**AFRIDIS** (ă-frē'diz). A tribe or clan on the north-west frontier of India, about the Khyber Pass, who have at various times given trouble to the British, and are included in a new (1922) scheme of Khassadars (irregulars). In 1897-8 a campaign ("the Tirah campaign") had to be undertaken against them, costly both in men and money, before British authority was asserted. In 1905 the Afridis of the force called the Khyber Rifles formed an escort for the Prince and Princess of Wales on their visit to the famous pass, which was long in their charge.—Cf. Holdich, *The Indian Borderland*.

**AFRIKANDER BUND.** An association dating from 1880 and founded for the purpose of consolidating Afrikander influence in South Africa. For a time it supported the policy of Cecil Rhodes, but after 1895 separated itself from him. After the war in 1902 the Bund was reorganised, and identified with the South African party whose policy is to further the federation of the South African colonies under the British crown.

**A'GA.** Formerly title of Turkish officers of a lower military rank, now of men of great wealth and influence except learned men and ecclesiastics, to whom the corresponding title of *effendi*, meaning "elder brother" and subsequently "master," is given.

**AG'ADES.** A town of Africa, near the middle of the Sahara, capital of the Saharan oasis of Aïr or Asben;

at one time a seat of great traffic, probably containing 60,000 inhabitants, now with a pop. of about 7000.

**AGADIR.** A little town on the Atlantic coast of Morocco, the Santa Cruz May of the Spaniards. Pop. 3692. It was seized by the Portuguese in the sixteenth century, and captured by Mulai Ahmed in 1536. It was once one of the most important seaports of Morocco, but is now closed to commerce and only used as a customs station, its place being taken by Mogador. In July, 1910, the appearance of a French cruiser in the port of Agadir gave rise to a Franco-German dispute, and in 1911 Germany sent the gunboat *Panther*, and a few days later the *Berlin*, to Agadir for the protection of German subjects. *See* FRANCE, GERMANY.

**AGA KHAN.** The hereditary chief of the Ismailite sect of the Mahommedans. His real name was Hasan Ali Shah and he was born in 1800. He became governor general of a province in Persia, but later settled in India and supported the British in their wars against the Sikhs and the Afghans. He died in 1881.

His grandson, **Aga Khan III.**, rendered great service to Britain during the Great War and took a prominent part in the discussions about the affairs of India in 1929-31. In 1930 he won the Derby with Blenheim.

**AGAL'MATOLITE** (Gr. *agalma*, image). A kind of stone, a clay-slate altered by heat and by the addition of alkalies, which is carved into images, etc., by the Chinese.

**AG'AMA.** A name of several lizards allied to the iguana, natives of both hemispheres.

**AGAMEM'NON.** In Greek mythology, son of Atreus, King of Mycenæ and Argos, brother of Menelaus, and commander of the allied Greeks at the siege of Troy. Returning home after the fall of Troy, he was treacherously assassinated by his wife, Clytemnestra, and her paramour, Ægisthus, Agamemnon's cousin. He was the father of Orestes, Iphigenia, and Electra.

**AG'AMI.** *See* TRUMPETER.

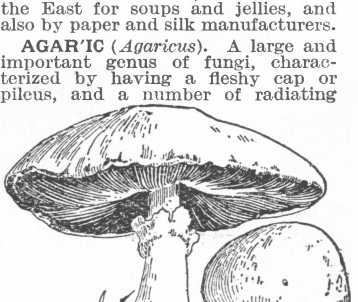
**AGAMOGENESIS** (-jen'e-sis ; Gr. *a*, priv., *gamos*, marriage, *genesis*, reproduction), the production of young without the congress of the sexes, one of the phenomena of alternate generation. *See* GENERATION and PARTHENOGENESIS.

**AGAPE** (ag'a-pē ; Gr. *agapē*, love). In ecclesiastical history, the love-feast or feast of charity, in use among the primitive Christians, when a liberal contribution was made by the rich to feed the poor. For a time the agape coincided with the *eucharist*, which, at its origin, was clearly funerary in its intention. "For as often as ye eat this bread and drink this cup, ye do show the Lord's death till he come." During the first three centuries love-feasts were held in the churches without scandal, but in after-times they acquired a bad reputation, not undeservedly, and they were condemned at the Council of Carthage in 397. Some modern sects, as the Wesleyans, Sandemanians, Moravians, etc., have attemped to revive this feast.

**AGAPEMONE** (ag-a-pem'o-nē ; lit. "the abode of love"). The name of a singular conventual establishment which has existed at Spaxton, near Bridgewater, Somersetshire, since 1859, the originator of it being a certain Henry James Prince, at one time a clergyman of the Church of England, who called himself the Witness of the First Resurrection. The life spent by the inmates appears to be a sort of religious epicureanism. Some of the proceedings of the inmates of the "Abode of Love" have resulted in applications to the courts of law, where parties formerly members of the society have returned to the world and sought to regain their rights from Prince and his followers, and such cases have caused some scandal. In 1902 Prince was succeeded by T. H. Smyth-Pigott.

**A'GAR-A'GAR.** A dried seaweed of the Asiatic Archipelago, the *Gracilaria lichenoides*, much used in the East for soups and jellies, and also by paper and silk manufacturers.

**AGAR'IC** (*Agaricus*). A large and important genus of fungi, characterized by having a fleshy cap or pileus, and a number of radiating



*Agaricus campestris*, the Common Mushroom

plates or gills on which are produced the naked spores. The majority of the species are furnished with stems, but some are attached to the objects

on which they grow by their pileus. Over a thousand species are known, and are arranged in five sections according to whether the colour of their spores is white, pink, brown, purple, or black. The chief British representatives are the common wild mushroom (*A. campestris*, L.), the Horse mushroom (*A. arvensis*, Schæff.), *A. elvensis*, B. and Br., *A. silvaticus*, Schæff., etc. Many of the species are edible, like the common mushroom, and supply a delicious article of food, while others are deleterious and even poisonous.

**AGARIC MINERAL** or **MOUNTAIN-MEAL.** One of the purest of the native carbonates of lime, found chiefly in the clefts of rocks and at the bottom of some lakes in a loose or semi-indurated form resembling a fungus. The name is also applied to a stone of loose consistence found in Tuscany, of which bricks may be made so light as to float in water, and of which the ancients are supposed to have made their floating bricks. It is a hydrated silicate of magnesium, mixed with lime, alumina, and a small quantity of iron.

**AGA'SIAS.** A Greek sculptor of Ephesus, about 400 B.C., whose celebrated statue, known as the Borghese Gladiator, representing a soldier contending with a horseman, is now in the Louvre, Paris.

**AGASSIZ** (ag'as-ē), **Louis John Rudolph.** An eminent naturalist, born 1807, died 1873, son of a Swiss Protestant clergyman at Motiers, near the eastern extremity of the Lake of Neufchâtel. He completed his education at Lausanne, and early developed a love of the natural sciences. He studied medicine at Zürich, Heidelberg, and Munich. His attention was first specially directed to ichthyology by being called on to describe the Brazilian fishes brought to Europe from Brazil by Martius and Spix. This work was published in 1829, and was followed in 1830 by *Histoire Naturelle des Poissons d'eaux douces de l'Europe Centrale* (Fresh-water Fishes of Central Europe). Directing his attention to fossil ichthyology, five volumes of his *Recherches sur les Poissons Fossiles* appeared between 1834 and 1844. His researches led him to propose a new classification of fishes, which he divided into four classes, distinguished by the characters of the skin, as ganoids, placoids, cycloids, and ctenoids. His system has not been generally adopted, but the names of his classes have been taken as useful terms. In 1836 he began the study of glaciers, and in 1840 he published his *Études sur les Glaciers*, in 1847 his *Système Glaciaire*.

From 1838 he had been professor of natural history at Neufchâtel, when in 1846 pressing solicitations and attractive offers induced him to settle in America, where he was connected as a teacher first with Harvard University, Cambridge, and afterwards with Cornell University as well as Harvard. After his arrival in America he engaged in various investigations and explorations, and published numerous works, including: *Principles of Zoology*, in connection with Dr. A. Gould (1848); *Contributions to the Natural History of the United States* (4 vols., 1857-62); *Zoologie Générale* (1854); *Methods of Study in Natural History* (1863). In 1865-6 he made zoological excursions and investigations in Brazil, which were productive of most valuable results.

**AGASSIZ** (ag'a-sē). Mount, an extinct volcano in Arizona, United States, 10,000 feet in height; a place of summer resort, near the Great Cañon of the Colorado.

**AG'ATE.** A semi-translucent compound mineral mass formed in the cavities of rocks by the successive deposition of various types of silica, or by the staining of a siliceous mass thus deposited along concentric zones. Bands or layers of various colours blended together, the base generally being chalcedony, and this mixed with variable proportions of jasper, amethyst, quartz, opal, heliotrope, and cornelian. The varying manner in which these materials are arranged causes the agate when polished to assume some characteristic appearances, and thus certain varieties are distinguished, as the ribbon agate, the fortification agate, the zone agate, the star agate, the moss agate, the clouded agate, etc. In Scotland they are cut and polished under the name of Scottish pebbles.

**AGATHA.** Christian saint and martyr. She was born in Sicily and was put to death in 251. She was canonized, her day being Feb. 5.

**AGATH'IAS.** A Greek poet and historian, born at Myrina, Asia Minor, about A.D. 530; author of an anthology, a collection of love poems, and a history of his own times, which is our chief authority for the period 552-8, during which time the Byzantine army was struggling against the Goths, Vandals, and Franks.

**AG'ATHON.** A Greek tragic poet, a friend of Euripides, and contemporary with Socrates and Alcibiades, born about 445 B.C., died about 402 B.C. The banquet which he gave to

celebrate his first dramatic victory was made the groundwork of Plato's *Symposium*.

**AGAVE** (a-gā'vē). A genus of plants, nat. ord. Amaryllidaceæ (which includes the daffodil and narcissus), popularly known as American aloes. They are generally large, and have a massive tuft of fleshy leaves with a spiny apex. They

Agave (*Agave americana*)

live for many years—ten to seventy according to treatment—before flowering. When this takes place, the tall flowering stem springs from the centre of the tuft of leaves, and grows very rapidly until it reaches a height of 15, 20, or even 40 feet, bearing towards the end a large number of flowers. The best-known species is *A. americanā*, known as the Maguey or "tree of wonders," introduced into Spain in 1561, and now extensively grown in the warmer parts of this continent as well as in Asia (India in particular).

This and other species yield various important products, the chief being the fibre obtained by maceration from the leaves and roots, and known commercially as American aloe, pita flax, or vegetable silk. The sap when fermented yields a beverage resembling cider, the *pulque* beer of the Spaniards, or is distilled into an intoxicating spirit (Mezcal or Aguardiente). The leaves are used for feeding cattle; the fibres of the leaves are formed into thread, cord, and ropes, and are also good material for paper-making; an extract from the leaves is used as a substitute for soap; slices of the withered flower-stem are used as razor-strops.

**AGDE** (ägd). A seaport of southern France, department of Hérault, with a cathedral, an ancient and remarkable structure. The trade, chiefly coasting, is extensive. Pop. 9265.

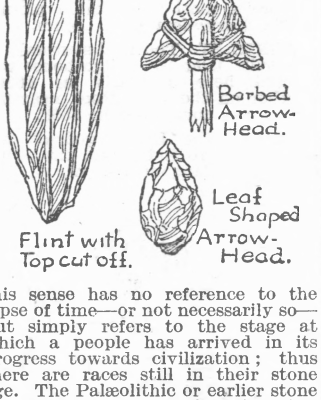
**AGE.** A period of time representing the whole or a part of the duration of any individual thing or being, but used more specifically in a variety of senses.

**Legal Aspects.** In law *age* is applied to the periods of life when men and women are enabled to do that which before, for want of years and consequently of judgment, they could not legally do. A male at twelve years old may take the oath of allegiance; at fourteen is at years of discretion, and therefore may choose his guardian or be an executor, although he cannot act until of age; and at twenty-one is at his own disposal, and may alienate and devise his lands, goods, and chattels. In English law a male at fourteen and a female at twelve may consent or disagree to marriage, but it cannot be celebrated without the consent of the parents or guardians until the parties are of age. A female at fourteen is at years of legal discretion, and may choose a guardian; at seventeen may be an executrix; and at twenty-one may dispose of herself and her lands. So that full age in male or female is twenty-one years, which age is completed on the day preceding the anniversary of a person's birth, who till that time is an infant, and so styled in law.

In France majority is attained at twenty-one, whilst the marriageable age is eighteen for males and fifteen for females, subject to consent of parents or guardians. In England no one can take a seat in Parliament under twenty-one, be ordained a priest under twenty-four, nor made a bishop under thirty. In France a seat in the Chamber of Deputies may be taken only at twenty-five and in the Senate at forty. The law of Scotland divides life into three periods—pupilarity, minority, and

majority. The first extends up to the time of legal puberty, that is, twelve years for a female and fourteen for a male, when they may marry; the second extends from this point up to twenty-one years, which is the time when majority is attained.

**The Archæological Ages** or **Periods** are three—the Stone Age, the Bronze Age, and the Iron Age, these names being given in accordance with the materials chiefly employed for weapons, implements, etc., during the particular period. The Stone Age of Europe has been subdivided into two—the Palæolithic or earlier, and Neolithic or later. The word *age* in




this sense has no reference to the lapse of time—or not necessarily so—but simply refers to the stage at which a people has arrived in its progress towards civilization; thus there are races still in their stone age. The Palæolithic or earlier stone age in Europe was doubtless immensely earlier than the Neolithic, the latter being marked by implements of much greater finish than the former. See STONE AGE.

**AGEN** (å-zhaŋ). One of the oldest towns in France, capital of department Lot-et-Garonne on the Garonne, 84 miles south-east of Bordeaux; see of a bishop; manufactures sailcloth and other articles, and has an extensive trade. The river is here crossed by a stone bridge, a suspension bridge, and a canal aqueduct. Pop. 24,939.

**AGENOR** (a-jē'nor). A mythical Greek hero, King of Phœnicia, and father of Europa and Cadmus. Also one of the bravest among the Trojans, slain by Neoptolemus.

**A'GENT.** A person appointed by another to act for or perform any kind of business for him, the latter being called in relation to the former the *principal*. Ambassadors were originally styled diplomatic agents.—In India, it is the name for an officer to whom political power is given to deal with native states.

**Army Agent** is a kind of military banker, authorised by the Government to manage the monetary affairs of a regiment. There are only a few of these agents, and consequently each has in charge the affairs of a number of different regiments.

**Crown Agents** are officials appointed by the secretary of state for the colonies to act as commercial and financial agents in this country for the different British colonies that are not self-governing; those that are self-governing appoint their own agents, who are designated *agents-general*.

**Agent in mechanics** is the general force producing a movement.

**AGERATUM** (a-jer'a-tum). A genus of composite plants of the warmer parts of America, one species of which, *A. mexicānum*, is a well-known flower-border annual with dense lavender-blue heads. From it have been derived several varieties with flowers of different colours used chiefly as bedding plants.

**AGER PUBLICUS.** See AGRARIAN LAW.

**AGGLOM'ERATE.** In geology, a collective name for masses consisting of angular fragments ejected from volcanoes. When a rock mass consists largely of fragments worn and rounded by water it is called a *conglomerate*, and such masses were originally, no doubt, gravels and shingles on sea beaches and river channels.

**AGG'REGATE.** A term applied in geology to rocks composed of several different mineral constituents capable of being separated by mechanical means, as granite, where the quartz, felspar, and mica can be separated mechanically.—In botany it is applied to flowers composed of many small florets having a common undivided receptacle, the anthers being distinct and separate, the florets commonly standing on stalks, and each having a partial calyx.

**AGHA.** *See* AGA.

**AGHRIM.** *See* AUGHRIM.

**AGINCOURT** (å-zhan-kör). A village of Northern France, department Pas de Calais, famous for the battle of 25th Oct., 1415, between the French and English. Henry V., King of England, eager to conquer France, landed at Harfleur, took the place by storm, and wished to march through

Picardy to Calais, but was met by a French army under the Constable d'Albret. The English numbered about 15,000 men, while the French numbers are variously given as from 50,000 to 150,000. The confined nature and softness of the ground were to the disadvantage of the French, who were drawn up in three columns unnecessarily deep. The English archers attacked the first division in front and in flank, and soon threw them into disorder. The second division fled on the fall of the Duc d'Alençon, who was struck down by Henry himself; and the third division fled without striking a blow. Of the French 10,000 were killed, including the Constable d'Albret, with six dukes and princes. The English lost 1600 men killed, among them the Duke of York, Henry's uncle. After the battle the English continued their march to Calias.

**AGIO** (ā'ji-o). The difference between the real and the nominal value of money, as between paper money and actual coin. It is used to denote both the difference between two currencies in the same country and the variations in the currencies of different countries. The term is derived from the It. *aggiungere*, to add, augment, hence *agiotage*. See DISAGIO and BALANCE OF TRADE.

**AGIRA** (à-jē'rà), (ancient **AGYRIUM**). A town of Sicily, south-west of Etna. Pop. 21,900.

**AGIS** (ā'jis). The name of four Spartan kings, the most important of whom was Agis IV., who succeeded to the throne in 244 B.C., and reigned four years. He attempted a reform of the abuses which had crept into the State—his plan comprehending a re-distribution of the land, a division of wealth, and the cancelling of all debts. Opposed by his colleague Leonidas, advantage was taken of his absence, in an expedition against the Ætolians, to depose him. Agis at first took sanctuary in a temple, but he was treacherously seized and strangled, after going through the form of a trial.

**AGISTMENT** (from the Lat. *ad*, to, and Fr. *giste*, lodging). A term designating the pasturing of horses, cattle, or sheep of another. See BAILMENT.

**AGITATORS.** An alternative form of *Adjutators*, a name given to the representatives elected in 1647 by the different regiments of the English parliamentary army.

**AGLOSSA.** A sub-order of anurous amphibia, the frogs, without a tongue.

**AGNANO** (à-nyà'nō). Until 1870 a lake of Italy, west of Naples, occupying probably the crater of an extinct volcano, but now drained.

**AG'NATES.** In the civil law, relations on the male side, in opposition to *cognates*, relations on the female side.

**AGNELLO PASS.** See EUROPEAN WAR.

**AGNES, ST.** A virgin martyr who, according to the story, suffered martyrdom because she steadfastly refused to marry Sempronius, the prefect of Rome, and adhered to her religion in spite of repeated temptations and threats, A.D. 303. She was first led to the stake, but as the flames did not injure her she was beheaded. Her festival is celebrated on 21st Jan. For superstitions connected with St. Agnes' Eve see Keats's poem *The Eve of St. Agnes*. Tintoret's most remarkable picture is *The Martyrdom of St. Agnes*.

**AGNES, ST.** The most southerly of the Scilly Islands. A lighthouse was erected here as early as 1680; another on the Wolf Rock near the island was completed in 1858.

**AG'NI.** The Hindu god of fire, second only to Indra, and one of the eight guardians of the world, and

Agni—the god of fire

especially the lord of the south-east quarter. He is celebrated in many of the hymns of the Rig Veda. He is often represented as of a red or flame colour, and rides on a ram or a goat. He is still worshipped as the personification of fire, and the friction of two sticks for procuring the temple fire is still regarded as the symbol of Agni's miraculous rebirth.

**AGNŒTÆ.** A monophysitic sect of the sixth century.

**AGNOLO, Baccio d'** (bȧch'ō dȧn'-yo-lō). A Florentine wood-carver, sculptor, and architect; designed some of the finest palaces, etc., in Florence, such as the Villa Borghese, the Palais Bartolini, etc.; born 1460, died 1543.

**AGNONE** (ȧ-nyō'nā). A town of S. Italy, province of Molise, famous for the excellence of its copper wares. Pop. 9,166.

**AGNOSTICS** (ag-nos'tiks; Gr. *a*, not, *gignōskein*, to know). A modern term invented by Huxley in 1869 and applied to those who disclaim any knowledge of God, the origin of the universe, immortality, etc. The agnostics, or adherents of this doctrine, hold that the mind of man is limited to a knowledge of phenomena and of what is relative, and that, therefore, the infinite, the absolute, and the unconditioned, being beyond all experience, are consequently beyond its range. Agnosticism is therefore the attitude of "solemnly suspended judgment," and cannot be identified with atheism. The agnostics do not deny the existence of a Divine Being, but merely maintain that we have no scientific ground for either belief or denial.—BIBLIOGRAPHY: Sir Leslie Stephen, *An Agnostic's Apology*; R. Flint, *Agnosticism*; J. Ward, *Naturalism and Agnosticism*.

**AGNUS CASTUS.** A shrub, *Vitex Agnuscastus*, nat. ord. Verveneaceæ, a native of the Mediterranean countries, with white flowers and acrid, aromatic fruits. It had anciently the imagined virtue of preserving chastity—hence the term *castus* (Lat., chaste).

**AGNUS DEI** (dē'ī; Lat., "the Lamb of God"). A term applied to Christ in John i. 29, and in the Roman Catholic liturgy a prayer beginning with the words "Agnus Dei," generally sung before the communion. The term is also commonly given to a medal, or more frequently a disc of wax, round, oblong, or oval, consecrated by the pope, stamped with the figure of a lamb supporting the banner of the cross; supposed to possess great virtues, such as preserving those who carry it in faith from accidents, etc. Jean Châtel, who attempted to assassinate Henry IV., was found covered with such medals.

**AGON'IC LINE** (Gr. *a*, not, and *gōnia*, an angle). In terrestrial magnetism a name applied to the line which joins all the places on the earth's surface at which the needle of the compass points due north and south, without any declination. *See* MAGNETISM.

**AG'ORA.** The market-place of a Greek town, corresponding to the Roman *forum*. The Agora of Athens is situated in a valley partially enclosed by the Acropolis, Areopagus, Pnyx, and Museum.

**AGOS'TA.** *See* AUGUSTA.

**AGOUARA** (ȧ-gų-ä'rȧ). A name given to the crab-eating racoon (*Procyon cancrivorus*) of S. America.

**AGOULT** (ȧ-gö'), **Marie de Flavigny, Comtesse d'.** A French writer of fiction, history, politics, philosophy, and art; daughter of Vicomte de Flavigny; born at Frankfort in 1805, died at Paris, 1876. She contributed many articles to the *Revue des Deux-Mondes*, etc., under the pseudonym of *Daniel Stern*, and wrote *Lettres Républicaines* (1848); *Histoire de la Révolution de* 1848; *Esquisses Morales et Politiques*; *Trois Journées de la Vie de Marie Stuart*; *Florence et Turin* (a series of artistic and political studies); *Dante et Goethe*; dialogues and numerous romances, etc.

**AGOUTA** (a-gö'tȧ), *Solenodon paradoxus*. An insectivorous mammal peculiar to Hayti, of the tanrec family, somewhat larger than a rat. It has its tail devoid of hair and covered with scales, its eyes small, and an elongated nose like the shrews. Another species (*S. cubānus*) belongs to Cuba.

**AGOUTI** (a-gö'ti). The name of several rodent mammals, forming a family by themselves, genus Dasyprocta. There are eight or nine species, all belonging to S. America and the W. Indies. The common agouti, or yellow-rumped cavy (*D. agouti*), is of the size of a rabbit. It burrows in the ground or in hollow trees, lives on vegetables, doing much injury to the sugar-cane, is as voracious as a pig, and makes a similar grunting noise. Its flesh is white and good to eat.

**AGRA** (ä'grȧ). A city of India, in the United Provinces, on the right bank of the Jumna, 841 miles by rail from Calcutta. It is a well-built and handsome town and has various interesting structures, among which are the imperial palace, a mass of buildings erected by several emperors; the Moti Masjid or Pearl Mosque (both within the old and extensive fort); the mosque called the Jama Masjid (a cenotaph of white marble); and, above all, the Taj Mahal, "a dream in marble," a mausoleum of the seventeenth century, built by the Emperor Shah Jehan (1628-58) for his favourite queen, Mumtaz Mahal. It is made of white marble, and is adorned throughout with exquisite mosaics. Its cost is estimated at

£800,000, and 20,000 workmen, under the direction of Austin of Bordeaux, were engaged on it for twenty-two years.

There are several Protestant and Roman Catholic churches, a government college, and three other colleges or high schools, besides a medical college. Agra has a trade in grain, sugar, etc., and some manufactures, including beautiful inlaid mosaics. It was founded in 1566 by the Emperor Akbar, and was a residence of the emperors for over a century. Pop. 229,764. The Agra division has an area of 8545 sq. miles, and a pop. of 4,182,825.

**AGRAFFE'.** A sort of ornamental buckle, clasp, or similar fastening for holding together articles of dress, etc., often adorned with precious stones.

**AGRAM, or ZAGREB.** A city in Yugoslavia, capital of the former Hungarian province of Croatia and Slavonia, near the River Sava; contains the residence of the ban or governor of Croatia and Slavonia, Government buildings, cathedral (being the see of a Roman Catholic archbishop), university, theatre, etc.; carries on an active trade, and manufactures tobacco, leather, and linens. Pop. 185,600.

**AGRA'PHIA.** See APHASIA.

**AGRARIAN LAWS.** Laws enacted in ancient Rome for the division of the public lands, that is, the lands belonging to the State (*ager publicus*). As the territory of Rome increased, the public land increased, the land of conquered peoples being always regarded as the property of the conqueror. The right to the use of this public land belonged originally only to the patricians or ruling class, but afterwards the claims of the plebeians on it were also admitted, though they were often unfairly treated in the sharing of it. Hence arose much discontent among the plebeians, and various remedial laws were passed with more or less success. Indeed an equitable adjustment of the land question between the aristocracy and the common people was never attained.

**AGRAVAINE, Sir.** One of the knights of the Round Table.

**AGREEMENT.** In English law, a written undertaking to do a certain thing. At least two persons must be parties to an agreement, which, though not a contract, is governed by the law of contract. There are various kinds of agreements, e.g. between master and servant, publisher and author, landlord and tenant. An agreement, if duly stamped (usually with a sixpenny stamp), can be used as evidence in a court of law.

**AGREEMENT OF THE PEOPLE.** *See* LEVELLERS.

**AGRIC'OLA, Gnæus Julius.** Lived from A.D. 37 to 93, a Roman consul under the Emperor Vespasian, and governor in Britain, the greater part of which he reduced to the dominion of Rome; distinguished as a statesman and general. His life, written by his son-in-law, the historian Tacitus, gives the best extant account of Britain in the early part of the period of the Roman rule. He was the twelfth Roman general who had been in Britain, but was the only one who effectually subdued the southern portion of it and reconciled the Britons to the Roman yoke. This he did by teaching them the arts of civilization and to settle in towns. He constructed the chain of forts between the Forth and the Clyde, defeated Galgacus at the battle of Mons Grauplus, and sailed round the island, discovering the Orkneys.

**AGRICOLA, Johann.** The son of a tailor at Eisleben, was born in 1492, and called, from his native city, *master of Eisleben* (*magister Islebius*); one of the most active among the theologians who propagated the doctrines of Luther. In 1537, when professor in Wittenberg, he stirred up the Antinomian controversy with Luther and Melanchthon. He afterwards lived at Berlin, where he died in 1566, after a life of controversy. Besides his theological works he composed a work explaining the common German proverbs.

**AGRICOLA, Johann Friedrich,** German musician and composer, born near Altenburg 1720, died at Berlin 1774; pupil of Sebastian Bach; wrote several operas, including *Iphigenia in Tauris*. He wrote under the pseudonym of "Olibrio."

**AG'RICULTURE.** Is the art of cultivating the ground, more especially with the plough and in large areas or fields, in order to raise grain and other crops for man and beast, including the art of preparing the soil, sowing and planting seeds, removing the crops, and also the raising and feeding of cattle or other live stock. This art is the basis of all other arts, and in all countries coeval with the first dawn of civilization. At how remote a period it must have been successfully practised in Egypt, Mesopotamia, and China we have no means of knowing, but there is sufficient evidence of agriculture having attained considerable development many centuries before the Christian era.

**Egyptian Agriculture.** Egypt was renowned as a corn country in the time of the Jewish patriarchs, and had probably been so for centuries before. The hieroglyphics on ancient monuments furnish records of the early development of agriculture in Egypt and of the use of the plough and other agricultural implements. The advanced methods of the Egyptians and Syrians were introduced into Europe by the Saracens. Land culture also attained a more or less considerable development in ancient China and Hindustan. Among the ancient Greeks the implements of agriculture were very few and simple. Hesiod, who wrote a poem on agriculture as early as the eighth century B.C., mentions a plough consisting of three parts, the sharebeam, the draught-pole, and the plough-tail, but antiquarians are not agreed as to its exact form. The ground received three ploughings, one in autumn, another in spring, and a third immediately before sowing the seed. Manures were applied, and the advantage of mixing soils, as sand with clay or clay with sand, was understood. Seed was sown by hand, and covered with a rake. Grain was reaped with a sickle, bound in sheaves, thrashed, then winnowed by wind, laid in chests, bins, or granaries, and taken out as wanted by the family, to be ground.

**Roman Agriculture.** Agriculture was highly esteemed among the ancient Romans, and very full accounts are contained in the works of Pliny, Virgil, Cato, Varro, and Palladius. The Romans used a great many different implements of agriculture. The plough is represented by Cato as of two kinds, one for strong, the other for light soils. Varro mentions one with two mould-boards, with which, he says, "when they plough, after sowing the seed, they are said to ridge." Pliny mentions a plough with one mould-board, and others with a coulter, of which he says there were many kinds. Fallowing was a practice rarely deviated from by the Romans. In most cases a fallow and a year's crop succeeded each other. Manure was collected from various sources, and irrigation was practised on a large scale.

The Romans introduced their agricultural knowledge among the Britons, and during the most flourishing period of the Roman occupation large quantities of corn were exported from Britain to the continent. During the time that the Angles and Saxons were extending their conquests over the country agriculture must have been greatly neglected; but afterwards it was practised with some success among the Anglo-Saxon population, especially, as was generally the case during the Middle Ages, on lands belonging to the Church. Swine formed at this time a most important portion of the live stock, finding plenty of oak and beech mast to eat.

**Feudal System.** The feudal system introduced by the Normans, though beneficial in some respects as tending to ensure the personal security of individuals, operated powerfully against progress in agricultural improvements. War and the chase, the two ancient and deadliest foes of husbandry, formed the most prominent occupations of the Norman princes and nobles. Thriving villages and smiling fields were converted into deer forests, vexatious imposts were laid on the farmers, and the serfs had no interest in the cultivation of the soil. But the monks of every monastery retained such of their lands as they could most conveneintly take charge of, and these they cultivated with great care, under their own inspection, and frequently with their own hands. The various operations of husbandry, such as manuring, ploughing, sowing, harrowing, reaping, thrashing, winnowing, etc., are incidentally mentioned by the writers of those days; but it is impossible to collect from them a definite account of the manner in which those operations were performed.

**Writings on Agriculture.** While there is much in the writings of the old English chroniclers concerning the tenure of land, upon which subject the *Domesday Book* gives much enlightenment, there is a great lack of information as to the manner in which the land was cultivated. Information began to be recorded in the middle of the thirteenth century, but only one treatise is known to have been written, namely, *La Dite de Husbanderye*, an essay in Norman French by Walter de Henley. This work was superseded by another treatise, the best of the early works on the subject, and published in the reign of Henry VIII. (in 1523) by Sir A. Fitzherbert, judge of the Common Pleas. It is entitled the *Book of Husbandry*, and contains directions for draining, clearing, and enclosing a farm, for enriching the soil, and rendering it fit for tillage. Lime, marl, and fallowing are strongly recommended.

The subject of agriculture attained some prominence during the reign of Elizabeth. The principal writers of that period were Tusser, Googe, and Sir Hugh Platt. Tusser's *Five Hundreth Pointes of Good Husbandry* (first complete edition published in

1580) conveys much useful instruction in metre, but few works of this time contain much that is original or valuable. The first half of the seventeenth century produced no systematic work on agriculture, though several on different branches of the subject. About 1645 the field cultivation of red clover was introduced into England, the merit of this improvement being due to Sir Richard Weston, author of a *Discourse on the Husbandry of Brabant and Flanders*, to whom also belongs the credit of first growing turnips in England. The Dutch had devoted much attention to the improvement of winter roots, and also to the cultivation of clover and other artificial grasses, and the farmers and proprietors of England soon saw the advantages to be derived from their introduction. Potatoes had been introduced during the latter part of the sixteenth century, but were not for long in general cultivation.

A number of writers on agriculture appeared in England during the Commonwealth, the most important works on the subject being Blythe's *Improver Improved* and Hartlib's *Legacy*. The former writer speaks of a rotation, or rather alternation of crops, and well knew the use of lime, as also of other manures.

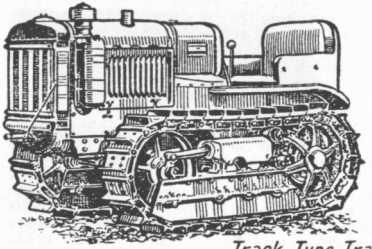
In the eighteenth century the first name of importance in British agriculture is that of Jethro Tull, a gentleman of Berkshire, who began to drill wheat and other crops about the year 1701, and whose *Horse-hoeing Husbandry* was published in 1731. Tull was a great advocate of the system of sowing crops in rows or drills with an interval between every two or three rows wide enough to allow of ploughing or hoeing to be carried on. This enabled the ground to be cleared with crops still growing, thus obviating the necessity for "bare fallow" and leading to the *four-course* or Norfolk Rotation of Charles, second Viscount Townshend, the first agriculturist to cultivate turnips on a large scale.

After the time of Tull and Townshend no great alteration in British agriculture took place till Robert Bakewell and others effected some important improvements in the breeds of cattle, sheep, and swine in the latter half of the eighteenth century. The raising and maintenance of live stock, especially of sheep, was a characteristic of English farming from a very early time, and for several centuries the country had almost a monopoly in the supply of wool. To Bakewell we owe the well-known breed of Leicester sheep. By the end of the century it was a common practice to alternate green crops with grain crops, instead of exhausting the land with a number of successive crops of corn. A well-known writer on agriculture at this period, and one who did a great deal of good in diffusing a knowledge of the subject, was Arthur Young.

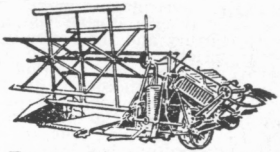
Scotland was for a long time behind England in agricultural progress. Great progress was made during the eighteenth century, however, especially in the latter half of it, turnips being introduced as a field-crop, and new implements such as the swing-plough and the thrashing-machine coming into general use. The construction of good roads through the country also gave agriculture a great impulse. During the wars caused by the French revolution (1795-1815) the high price of agricultural produce led to an extraordinary improvement in agriculture all over Britain. The establishment of the institution called the National Board of Agriculture was also of very great service to British husbandry at this period. Though a private association, it was assisted by an annual parliamentary grant, and prizes were given by it for the encouragement of experiments and improvements in agriculture. It existed from 1793 to 1816.

**Agricultural Societies.** Among other societies which have greatly furthered the progress of agriculture in Britain, the chief in existence at the present day are the Smithfield Club, inaugurated in 1798; the Royal Agricultural Society of England, established in 1838; the Highland and Agricultural Society of Scotland, founded in 1783; and the Royal Agricultural Society of Ireland, instituted in 1841. The objects of these and similar societies are such as the following: To encourage the introduction of improvements in agriculture; to encourage the improvement of agricultural implements and farm buildings; the application of chemistry to agriculture; the destruction of insects injurious to vegetation; to promote the discovery and adoption of new varieties of grain, or other useful vegetables; to collect information regarding the management of woods, plantations, and fences; to improve the education of those supported by the cultivation of the soil; to improve the veterinary art; to improve the breeds of live stock, etc. Shows are held, at which prizes are distributed for live stock, implements and farm produce.

Through the efforts of the above mentioned and other societies, the investigations of scientific men, the



Track Type Tractor



Tractor Binder

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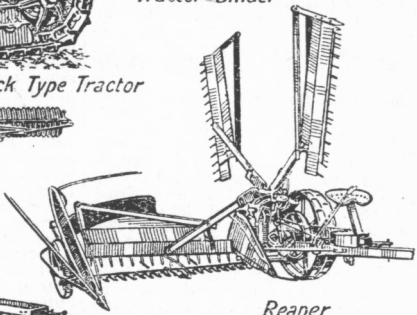
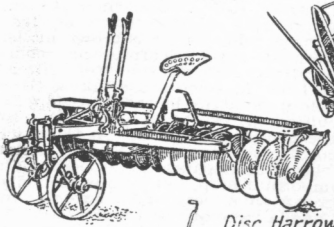
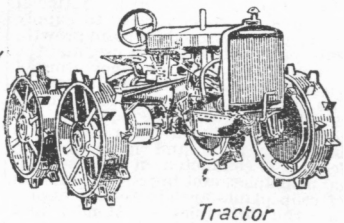


Reaper



Disc Harrow



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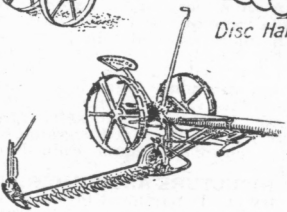
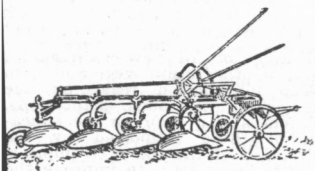
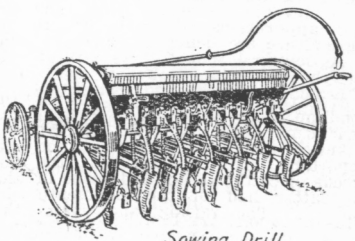


Gear Mower



Tractor Plough



Sowing Drill

general diffusion of knowledge among all classes, and the necessity of competing with producers in foreign countries, agriculture made vast strides in Britain during the nineteenth century and the beginning of the twentieth. Among the chief improvements we may mention deep ploughing and thorough draining. By the introduction of new or improved implements the labour necessary to the carrying out of agricultural operations has been greatly diminished, and advancement in this direction has been promoted by the necessities of the Great War. Labour-saving machinery is likely to be used in future on an increasingly large scale.

**Scientific Research.** Science, too, has been called in to act as the handmaid of art, and in its application we owe very much to the researches conducted at the Rothamsted Experimental Station, founded in 1834 by Lawes, who endowed the Lawes Trust in 1889. Gilbert and he worked together from 1843 to the end of last century. It is primarily by the investigations of the chemist and physicist that agriculture has been put on a really scientific basis. The physiology of plants and animals, and the complex properties of soils, have all been investigated, and most important results obtained. Artificial manures, in great variety to supply the elements wanted for plant growth, have come into common use, and the free nitrogen of the air is now worked up into various substances by which the nitrate of soda imported from South America can be replaced. An improvement in all kinds of stock is becoming more and more general, feeding is conducted on more scientific principles, and improved varieties of crop-plants are created by applying the principles of Mendel and other scientists. Much attention is also devoted to seed-testing, and the applications of electricity to agriculture are being developed.

**Agricultural Schools.** As a result of the new conditions, to be a thoroughly-trained and competent agriculturist requires a special education, partly theoretical, partly practical. In many countries there are now agricultural schools or colleges supported by the State, and many such institutions exist in Britain. In Scotland, the Edinburgh chair of Rural Economy was founded in 1790 ; in Ireland, the Glasnevin Institution was inaugurated in 1838 ; and the establishment of the Royal Agricultural College, Cirencester, dates from 1845. In the United States nearly all the States have now colleges, or departments of colleges, devoted to the teaching of agriculture, and large allotments of public land have been made for their support. There are also numerous experimental stations. In Britain there has been a Board of Agriculture since 1889, under a cabinet minister, which was constituted a ministry in 1919 ; previously there was only a department under a committee of the Privy Council.

**World Crops.** It is probable that on the whole the agriculture of Britain is farther advanced than that of any other region of similar size. Wheat, barley, and oats are the chief cereals in Britain ; the chief roots are turnips and potatoes ; other crops (besides grass and clover) are beans, peas, mangold, hops, and flax. In Europe at large the principal cereals are wheat, oats, barley, and rye, wheat being mostly grown in the middle and southern regions, such as France, Spain, part of Germany, Austria, Hungary, Italy, and southern Russia, the others in the more northern portion, while maize is grown in the warmest parts. Turnips are comparatively little grown out of Britain, beetroot in some sense taking their place ; potatoes, however, are largely cultivated, except in the south. In the United States maize is the chief corn crop, next to which comes wheat, then oats ; potatoes are an important crop, but turnips are only grown to a very small extent. In Canada large quantities of wheat are grown (more especially in Manitoba and the North-West), much is also now produced in the Australian colonies, in India, Argentina, etc.—

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**AGRICULTURE AND FISHERIES, Ministry of.** Department of state. It looks after the interests of agriculture and fisheries for England and Wales, but not for the Irish Free State or Northern Ireland, which have their own boards, or for Scotland, which also has its own Board of Agriculture. It is also reponsible for the Ordnance Survey and Kew Gardens. The ministry collects statistics and administers the law concerning diseases of animals and fixing of agricultural wages, and has departments for encouraging education and research. The Board of Agriculture was set up in 1889, and in 1903 took over the duties of the Fishery Dept. of the Board of Trade. In 1909 it was made a ministry. Its head offices are in Whitehall, London, S.W.

**AGRIGENTUM** (-jen'tum) (modern **GIRGENTI**). An ancient Greek city

of Sicily, founded about 580 B.C., and long one of the most important places on the island. The town is also famous as the birthplace of the philosopher Empedocles. Extensive ruins of splendid temples and public buildings yet attest its ancient magnificence. See GIRGENTI.

**AG'RIMONY** (Agrimonia). A genus of plants, nat. ord. Rosaceæ, consisting of slender perennial herbs found in temperate regions. *A. Eupatoria*, or common agrimony, was formerly of much repute as a medicine in England. Its leaves and rootstock are astringent, and the latter yields a yellow dye. The plant is a common weed on the borders of cornfields and on roadsides.

**AGRIPPA, Herod.** See HEROD AGRIPPA.

**AGRIPPA, Marcus Vipsanius.** A Roman statesman and general, the son-in-law of Augustus; born 63 B.C., died 12 B.C. He was prætor in 41 B.C.; consul in 37, 28, and 27; ædile in 33; and tribune from 18 till his death. He commanded the fleet of Augustus in the battle of Actium. To him Rome is indebted for three of her principal aqueducts, the Pantheon, and several other works of public use and ornament.

**AGRIPPI'NA.** The name of several Roman women, among whom we may mention: 1. The youngest daughter of Marcus Vipsanius Agrippa, and wife of C. Germanicus; a heroic woman, adorned with great virtues. Tiberius, who hated her for her virtues and popularity, banished her to the Island of Pandataria, where she starved herself to death in A.D. 33.

2. A daughter of the last mentioned, and the mother of Nero, by Domitius Ahenobarbus. Her third husband was her uncle, the Emperor Claudius, whom she subsequently poisoned to secure the government of the Empire through her son Nero. After ruling a few years in her son's name he became tired of her ascendency, and caused her to be assassinated (A.D. 60).

**AGROPYRON.** A genus of grasses most of which are perennials. The root-stalks of *Agropyron repens* (*Radix Graminis*) have aperient and diuretic properties.

**AGROSTEM'MA.** *See* CORNCOCKLE.

**AGROS'TIS.** A genus of grasses, consisting of many species, and valuable as pasture-grasses. The bent-grasses belong to the genus.

**AG'TELEK.** A village in Hungary, near the road from Pesth to Kassa, with about 600 inhabitants, celebrated for one of the largest and most remarkable stalactitic caverns in Europe.

**AGUA** (ág'wâ). An active volcano of Central America, in Guatemala, rising to the height of 15,000 feet. It has twice destroyed the old city of Guatemala, in its immediate vicinity.

**AGUARA** (â-gwä'râ). *See* AGOUARA.

**AGUARDIENTE** (â-gwär-dē-en'te). A popular spirituous beverage of Spain and Portugal, a kind of coarse brandy, made from red wine, from the refuse of the grapes left in the wine-press, etc., generally flavoured with anise; also a Mexican alcoholic drink distilled from the fermented juice of the agave.

**AGUAS CALIENTES** (ág'wâs kâ-lē-en'tâs; lit. "warm waters"). A town 270 miles N.W. of Mexico, capital of the State of its own name, named from the thermal springs near it; has manufactures of cottons and a considerable trade. Pop. 48,000.—**Aguas Calientes State** has an area of 2,968 sq. miles, and a pop. of 132,492.

**AGUE** (ā'gū). A kind of fever, which may be followed by serious consequences, but generally is more troublesome than dangerous. According to the length of the interval between one febrile paroxysm and another, agues are denominated *quotidian* when they occur once in twenty-four hours, *tertian* when they come on every forty-eight hours, *quartan* when they visit the patient once in seventy-two hours. Ague arises from marsh miasmata, a temperature above 60° being, however, apparently required to produce it. To cure the disease and prevent the recurrence, quinine and various other bitter and astringent drugs are given with complete success in the majority of cases.

**AGUE-CAKE.** A tumour caused by enlargement and hardening of the spleen, often the consequence of ague or intermittent fever.

**AGUILAR** (â-gē-lär'). A town of Spain, province of Cordova, in Andalusia, in a good wine-producing district, and with a trade in corn and wine. Pop. 12,635.

**AGUILAR** (a-gi-lär), **Grace.** An English writer, born at Hackney, 1816, died at Frankfort, 1847. Of Jewish parentage, she at first devoted herself to Jewish subjects, such as *The Women of Israel*, *The Jewish Faith*, etc.; but her fame rests on her novels, *Home Influence*, *A Mother's Recompense*, *Home Scenes and Heart Studies*, etc., most of which were published posthumously by her mother.

**AGUILAS** (ȧ-gē'lȧs). A flourishing seaport of Southern Spain, province of Murcia, with copper and lead smelting works. Pop. 17,078.

**AGULHAS** (ȧ-gu̯l'yȧs), **Cape.** A promontory, forming the most southern extremity of Africa, about 90 miles south-east of the Cape of Good Hope, rising to 455 feet above the sea, with a lighthouse.

**AGU'TI.** *See* AGOUTI.

**A'HAB.** The seventh King of Israel, succeeded his father Omri, 918-897 or 875-853 B.C. At the instigation of his wife Jezebel he erected a temple to Baal, and became a cruel persecutor of the true prophets. He was killed by an arrow at the siege of Ramoth-Gilead. He was succeeded by his son Ahaziah.

**AHAG'GAR.** A mountainous region of the Sahara, south of Algeria, with some fertile valleys, inhabited by the Tuaregs.

**AHANTA.** *See* GOLD COAST, WEST AFRICA.

**AHASUE'RUS.** In Scripture history, a king of Persia, probably the same as Xerxes, the husband of Esther, to whom the Scriptures ascribe a singular deliverance of the Jews from extirpation.—**Ahasuerus** is also a Scripture name for Cambyses, the son of Cyrus (Ezra iv. 6), and for Astyages, King of the Medes (Dan. ix. 1). Ahasuerus is also the traditional name of the wandering Jew.

**A'HAZ.** The twelfth King of Judah, succeeded his father Jotham, 742-727 or 734-715 B.C. Forsaking the true religion, he gave himself up completely to idolatry, and plundered the temple to obtain presents for Tiglath-Pileser, King of Assyria.

**AHAZI'AH.** 1. Son of Ahab and Jezebel, and eighth King of Israel, died from a fall through a lattice in his palace at Samaria after reigning two years (896, 895 B.C.).

2. Fifth or sixth King of Judah, and nephew of the above. He reigned but one year, and was slain (884 B.C.) by Jehu.

**AHMADABAD,** or **AHMEDABAD** (ä-mad-ä-bäd). A town of India, presidency of Bombay, in district of its own name, on the left bank of the Sábarmatí, 309 miles north of Bombay. It was founded in 1412 by Ahmed Shah, and was converted by him into a great capital, adorned with splendid edifices. It came finally into the hands of the British in 1818. It is still a handsome and populous place, enclosed by a wall, with many noteworthy buildings; manufactures of fine silk and cotton fabrics, cloths of gold and silver, pottery, paper, enamel, mother-of-pearl, etc. There were disturbances here in 1919. Pop. 310,000.—Area of district, 3824 sq. miles; pop. 890,911.

**AHMADNAG'AR.** A town of India, presidency of Bombay, in district of its own name, surrounded by an earthen wall; with manufactures of cotton and silk cloths. Near the city is the fort, built of stone and 1½ miles round. Pop. (including military) 49,878.—Area of district, 6610 sq. miles; pop. 731,552.

**AHMED MIRZA.** Shah of Persia, born in 1898. He succeeded his father, Mohammed Ali, in 1909, and was deposed in 1925.

**AHMED SHAH.** Born 1724, died 1773, founder of the Durâni dynasty in Afghanistan. On the assassination of Nadir he proclaimed himself shah, and set about subduing the provinces surrounding his realm. Among his first acts was the securing of the famed Koh-i-noor diamond, which had fallen into the hands of his predecessor. He crossed the Indus in 1748, and his conquests in Northern India culminated in the defeat of the Mahrattas at Panipat (6th Jan., 1761). Affairs in his own country necessitated his withdrawal from India, but he extended his empire vastly in other directions far beyond the limits of modern Afghanistan. He was succeeded by his son Timur.

**AHRIMAN** (ä'ri-man; in the Zend *Angromainyus*, "spirit of evil or annihilation"). According to the dualistic doctrine of Zoroaster, the origin or the personification of evil, sovereign of the Devas or evil spirits, lord of darkness and of death, being thus opposed to Ormuzd (*Ahuramazda*), the spirit of good and of light.

**AH'WAZ.** A small Persian town on the River Karun, province of Khuzistan, at the head of river navigation, a place of some commercial note. In the neighbourhood are the vast ruins of a city supposed to date from the time of the Parthian Empire.

**AI** (ä'ē). *See* SLOTH.

**AI'DAN, Saint.** Bishop of Lindisfarne, was originally a monk of Iona in which monastery Oswald I., who became king of Northumberland in 635, had been educated. At the request of Oswald, Aidan was sent to preach Christianity to his subjects and established himself in Lindisfarne as the first Bishop of Durham. He died in 651.

**AIDE-DE-CAMP** (ād-dȧ-kȧṇ), A military officer who conveys th

orders of a general to the various divisions of the army on the field of battle, and at other times acts as his secretary and general confidential agent.

**AIDIN** (å-i-dēn′), or **GUZEL HISSAR.** A town in Asia Minor, about 70 miles south-east of Smyrna, with which it is connected by rail; has fine mosques and bazaars, is the residence of a pasha, and has an extensive trade in cotton, leather, figs, grapes, etc. Pop. 70,000.

**AIGRETTE′** (French). A term used to denote the feathery crown attached to the seeds of various plants,

Aigrettes

such as the thistle, dandelion, etc. (called in botany *pappus*).—It is also applied to any head-dress in the form of a plume, whether composed of feathers, flowers, or precious stones.

**AIGUES MORTES** (āg mort; Lat. *Aquæ Mortuæ*, "dead waters"). A small town of Southern France, near the mouths of the Rhone, department of Gard; with ancient walls and castle; near it are lagoons, from which great quantities of salt are extracted. Pop. 4511.

**AIGUILLE** (ā′gwil; Fr., lit. a needle). A name given in the Alps to the needle-like points or tops of granite, gneiss, quartz, and other crystalline rocks and mountain masses; also applied to sharp-pointed masses of ice on glaciers and elsewhere.—It is also the name given to a peculiarly-shaped French mountain in Isère, 6500 feet high.

**AIGUN** (i-gun′). A town of China, in Manchuria, on the Amur, with a good trade. Pop. 36,800.

**AI′KIN, John, M.D.** An English miscellaneous writer, born 1747, died 1822. He practised as physician at Chester, Warrington (where he taught physiology and chemistry at the Dissenters' Academy), and London; turned his attention to literature and published various works of a miscellaneous description, some in conjunction with his sister Mrs. Barbauld, including the popular *Evenings at Home* (1792-5), written with the view of popularising scientific subjects. His *General Biographical Dictionary* (in 10 vols.) was begun in 1799 and finished in 1815. He was editor of the *Monthly Magazine* from 1796 till 1807.

**AI′KIN, Lucy.** Daughter of the preceding, was born in 1781, and died 1864. In 1810 she published *Poetical Epistles on Women*, which was followed by a number of books for the young and a novel *Lorimer* (1814). In 1818 appeared her *Memoirs of the Court of Queen Elizabeth*, a very popular work. She afterwards produced similar works on the reigns of James I. (1822) and Charles I. (1833), and a *Life of Addison* (1843). In 1824 she had published the literary remains and biography of her father. She carried on an interesting correspondence with Dr. Channing from 1826-42, which was published in 1874.

**AILAN′TO,** or **AILANTHUS** (meaning tree of the gods). A tree, genus Ailantus, nat. ord. Simarubaceæ. The *A. glandulōsa*, a large and handsome tree, with pinnate leaves 1 or 2 feet long, is a native of China, but has been introduced into Europe and North America. A species of silk-worm, the ailanthus silk-worm (*Saturnia cynthia*), feeds on its leaves, and the material produced, though wanting the fineness and gloss of mulberry silk, is produced at less cost, and is more durable. The wood is hard, heavy, yellowish-white, and will take a fine polish. The tree has been in cultivation in England since 1751.

**AILERON.** *See* AERONAUTICS, AEROPLANE.

**AIL′RED** (contracted form of **ETHELRED**). A religious and historical writer, supposed to have been born in 1097, but whether in Scotland or in England is not known, died 1166; abbot of Rievaulx, in the North Riding of Yorkshire. Wrote lives of Edward the Confessor and St. Margaret, Queen of Scotland, *Genealogy of the Kings of England*, *The Battle of the Standard*, etc.

**AILSA, Marquess of.** Scottish title held by the family of Kennedy. In 1482 Gilbert Kennedy was made a lord, and in 1509 his descendant was made Earl of Cassilis. He was killed at Flodden, and the 3rd earl was poisoned in France. In 1831 the 12th earl was made a marquess. The family seat is Culzean Castle, Ayrshire, and the eldest son is called Earl of Cassilis. The title is taken from Ailsa Craig, an island rock at the mouth of the Firth of Clyde.

**AILSA CRAIG.** A rocky islet in the Firth of Clyde, 10 miles from the coast of Ayr, of a conical form 1097

Ailsa Craig

feet high, and about 2 miles in circumference, precipitous on all sides except the north-east, where alone it is accessible, frequented by innumerable sea-fowl, including solan-geese, and covered with grass. On it is a lighthouse. Granite is quarried.

**AILU'RUS.** *See* PANDA.

**AIMARD** (ā-mär), **Gustave.** French novelist, born 1818, died 1883. He lived for ten years among the Indians of North America, and wrote a number of stories dealing with Indian life, such as *Les Trappeurs de l'Arkansas* (1858), *La Loi de Lynch* (1859), *Les Nuits Mexicaines* (1863), *Les Bohèmes de la Mer* (1865), which have been popular in English translations. His work is not unlike that of Fenimore Cooper.

**AIN** (aŋ). A south-eastern frontier department of France, mountainous in the east (ridges of the Jura), flat or undulating in the west, divided into two nearly equal parts by the River Ain, a tributary of the Rhône; area, 2248 sq. miles; pop. (1926), 322,918. Capital, Bourg.

**AINLEY, Henry Hinchcliffe.** English actor. Born at Morley, near Leeds, Aug. 21, 1879, he became clerk in a bank at Sheffield. He left this to become an actor and made his first appearance in London in 1900. Ainley has successfully played in many Shakespearian parts, as well as in *Trilby*, *Peter Pan*, *The Little Minister* and *The Great Adventure*; and *Hassan*, *The Dover Road*, *Oliver Cromwell*, *The First Mrs. Fraser* and *Tobias and the Angel* since 1919. He has also played in the United States and Australia.

**AINOS** (ī'nōz; that is, men). The native name of an uncivilized race of people inhabiting the Japanese island of Yesso, as also Sakhalien, and the Kurile Islands, and believed to be the aboriginal inhabitants of Japan. They do not average over 5 feet in height, but are strong and active. They are very hairy, wear matted beards, and have black hair which they allow to grow till it falls over their shoulders. Their complexion is dark brown, approaching to black. They support themselves by hunting and fishing. There are numerous legends relating to the Ainos. According to one of these, of Japanese origin, they descended from the constellation of the Bear, whilst another mentions as their ancestor a certain Okikurumi who came down from heaven. The Ainor call themselves Ainu Utara, and the Chinese refer to them as the Tungi (barbarians of the East). They are very superstitious, and worship a number of gods, such as the universal god (Opitta-Kamui), the sun (Tsup-Kamui), the bear (Isho-Kamui), etc. Cf. J. Batchelor, *The Ainu and their Folklore*.

**AINSWORTH, Robert.** Born in Lancashire, 1660, earned his living by keeping a private school in or near London, and died there in 1743. Among other learned works he compiled the well-known *Latin and English Dictionary*, first published in 1736, which passed through many editions, but is now entirely superseded.

**AINSWORTH, William Francis.** An English physician, geologist, and traveller, born 1807. He was surgeon and geologist to the Euphrates expedition under Colonel Chesney and published *Researches in Assyria Babylonia, and Chaldæa* (1838); *Travels in Asia Minor, Mesopotamia and Armenia* (1842); *Travels in the Track of the Ten Thousand Greeks* (1844), etc. Died 1896.

**AINSWORTH, William Harrison.** An English novelist, born 1805, died 1882. He was the son of a Manchester solicitor and intended for the profession of law, but devoted himself to literature. He wrote *Rookwood* (1834), *Jack Sheppard*, illustrated by Cruikshank (1839), and about forty other novels, including *Guy Fawkes*, *Tower of London*, *Windsor Castle*, *Lancashire Witches*, *Flitch of Bacon*, etc. His literary models were at first Sir Walter Scott and afterwards Victor Hugo's *Nôtre Dame de Paris*.

**AIN-TAB** (ā-in-tāb'). A town of Northern Syria, 60 miles north of Aleppo; with manufactures of cottons, woollens, leather, etc., and an extensive trade. There is here an American Protestant mission. Pop. 39,998.

**AINU.** *See* AINOS.

**AIR.** The gaseous substance of which our atmosphere consists, being a mixture mainly of about 78 per cent by volume of nitrogen and 21 per cent of oxygen. The latter is absolutely essential to animal life, while the purpose chiefly served by the nitrogen appears to be to dilute the oxygen. Oxygen is more soluble in water than nitrogen, and hence the air dissolved in water contains about 10 per cent more oxygen than atmospheric air. The oxygen therefore available for those animals which breathe by gills is somewhat less diluted with nitrogen, but it is very much diluted with water. For the various properties and phenomena connected with air see such articles as ATMOSPHERE, AERONAUTICS, AIR-PUMP, BAROMETER, COMBUSTION, RESPIRATION, ETC.

**AIR.** In music (in It. *aria*), a continuous melody, in which some lyric subject or passion is expressed. The lyric melody of a single voice, accompanied by instruments, is its proper form of composition. Thus we find it in the higher order of musical works; as in cantatas, oratorios, operas, and also independently in concertos.—**Air** is also the name often given to the upper or most prominent part in a concerted piece, and is thus equivalent to *treble*, *soprano*, etc.

**AÏR, or ASBEN.** *See* ASBEN.

**AIRA.** *See* HAIR-GRASS.

**AIR BEDS AND CUSHIONS.** Often used by the sick and invalids, are composed of india-rubber or of cloth made air-tight by a solution of india-rubber, and when required for use filled with air, which thus supplies the place of the usual stuffing materials. They tend to prevent bed-sores from continuous lying in one position. They are also cheap and easily transported, as the bed or cushion, when not in use, can be packed in small compass, to be again inflated with air when wanted.

**AIR-BLADDER.** *See* SWIMMING-BLADDER.

**AIR-BRAKE.** A brake operated by air pressure, usually applied to brake, simultaneously, all the wheels of a moving train. In the Westinghouse type, by means of an ingenious "triple valve" carried one on each carriage, the train pipe is made to serve the dual purpose of supply and control. An air-pump on the engine compresses air into the main receiver, from which it flows through a reducing valve into the train pipe. The pressure, acting on the under side of the triple valve, moves the valve to its extreme position, thereby opening a passage to an auxiliary receiver on the carriage and also putting the brake cylinder into communication with the atmosphere. A spring in the brake cylinder keeps the brakes in the "off" position.

To apply the brakes, the pressure is lowered in the train pipe. The air pressure in the auxiliary receiver reverses the triple valve, thus admitting air to the brake cylinder and closing the outlet to atmosphere.

To remove the brakes, air from the main receiver is passed into the train pipe, and the triple valve is restored to the "off" position.—BIBLIOGRAPHY: W. W. Wood, *Westinghouse Air-brake*; R. H. Blackhall, *Air-brake Catechism*.

**AIRBRUSH.** A device for spraying paint, etc., upon a surface by means of compressed air, the instrument consisting of a paint reservoir, air pump and holder with nozzles.

**AIR-CELLS.** Cavities in the cellular tissue of the stems and leaves of plants which contain air only, the juices of the plants being contained in separate vessels. They are largest and most numerous in aquatic plants, as in the *Vallisneria spirālis* and the *Victoria regia*, the gigantic leaves of which latter are buoyed up on the surface of the water by their means.

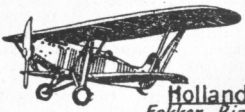
The minute cells in the lungs of animals are also called air-cells. There are also air-cells in the bodies of birds. They are connected with the respiratory system, and are situated in the cavity of the thorax and abdomen, and sometimes extend into the bones. They are most fully developed in birds of powerful and rapid flight, such as the albatross.

**AIR COUNCIL.** Department of the British Government. It is responsible for the control of the Royal Air Force, and of flying generally. Its president is the Secretary of State for Air, and it consists of five other members and a secretary. The offices are at Gwydyr House, Whitehall, London, S.W.1.

**AIR'CRAFT.** Name of any airship, aeroplane or other flying machine. In Great Britain as in other countries all aircraft must be registered, and in 1930 there were 846 machines on the civil register which is kept by the Air Ministry. The machines are registered after having been passed by the

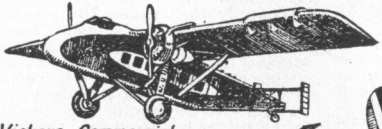
France
Amiot Multi Seat Fighter

Germany
Junkers Monoplane

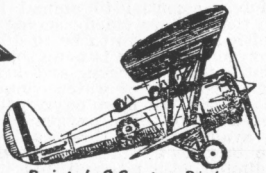


Holland
Fokker Biplane

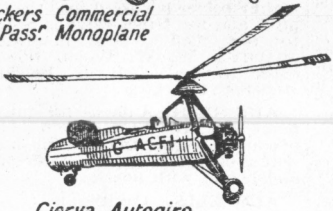
Italy
Fiat Cabin Monoplane



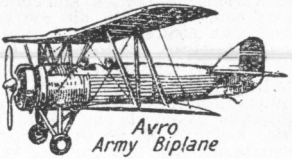
Vickers Commercial
12 Pass^r. Monoplane



Bristol 2 Seater Biplane



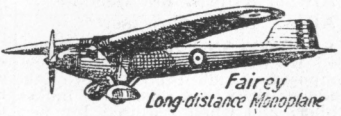
Cierva Autogiro



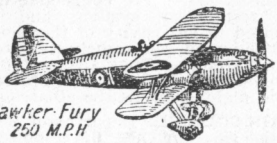
Avro
Army Biplane

Westland Wapiti
Army Biplane

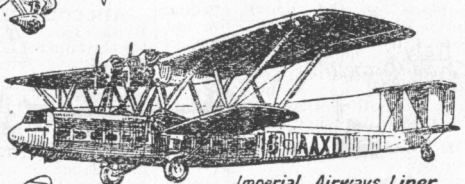
Pterodactyl
3 Seater Monoplane.



Fairey
Long-distance Monoplane



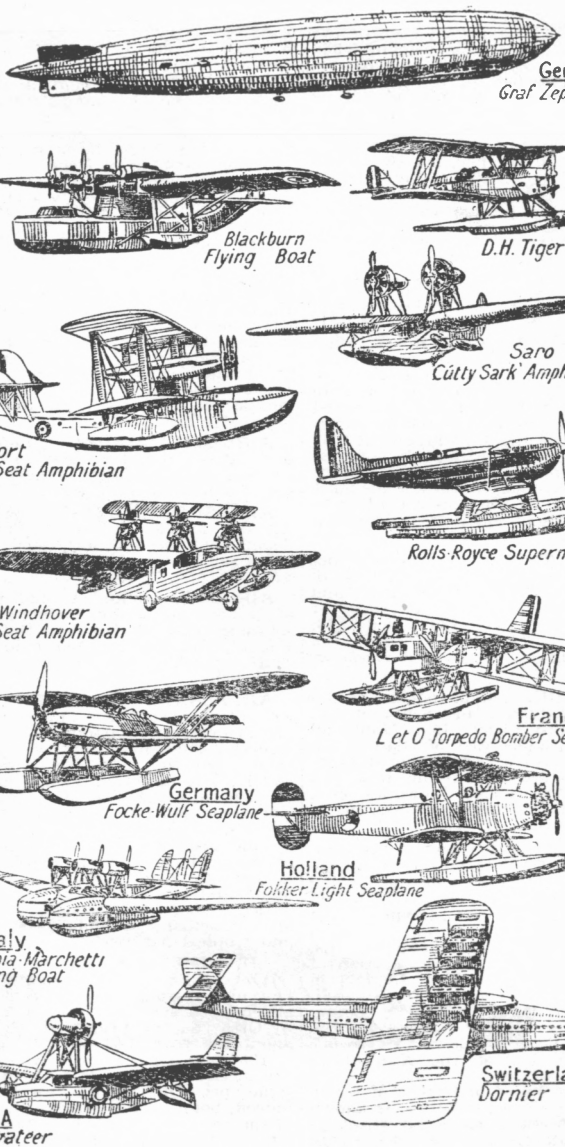
Hawker Fury
250 M.P.H



Imperial Airways Liner
(38 Passengers)

D.H. Gipsy Moth Biplane

MODERN TYPES OF AIRCRAFT


Germany
Graf Zeppelin
Blackburn
Flying Boat
D.H. Tiger Moth
Saro
'Cutty Sark' Amphibian
Short
6 Seat Amphibian
Rolls-Royce Supermarine
Windhover
6 Seat Amphibian
France
L et O Torpedo Bomber Seaplane
Germany
Focke-Wulf Seaplane
Holland
Fokker Light Seaplane
Italy
Savoia-Marchetti
Flying Boat
Switzerland
Dornier DoX
U.S.A.
Privateer

Ministry or the British Corporation as airworthy. Of the machines 333 were privately owned and 68 belonged to clubs.

The system of marking aircraft is similar to that of marking motor vehicles. A letter is given to each country, and the machines marked with that letter followed by letters from AAA to ZZZ. Thus Great Britain has the letters G and M, so her machines are marked G.AAA or M.AAA, and so on.

The letters assigned to other countries are as follows :

| | | |
|---|---|---|
| Belgium, ON. | Italy, I. | Sweden, SA. |
| France, F. | Netherlands, PH. | Switzerland, HB. |
| Germany, D. | Norway, LA. | United States, K. |
| Spain, EA. | Irish Free State, EI. | |

**AIRCRAFT CARRIER.** Warship fitted for carrying seaplanes. In the British navy the first was the *Ark Royal*, launched in 1914. Others were added, these being cruisers converted to this use. Some were retained after the conclusion of the war, and in 1932 there were three carriers in commission, *Furious*, *Glorious*, and *Courageous*. The tonnage of these ships must not exceed 27,000 tons according to the agreement made at Washington in 1924.

**AIRD, Thomas.** A Scottish poet and miscellaneous writer, friend of Professor Wilson, De Quincey, and Carlyle, long editor of a newspaper in Dumfries; born 1802, died 1876. He wrote *The Devil's Dream on Mount Aksbeck*; *The Old Bachelor*, etc.

**AIRDRIE.** A municipal and parliamentary burgh of Scotland, in Lanarkshire, near the Monkland Canal, 11 miles east of Glasgow, in the centre of a rich mining district, with a large cotton-mill, foundries and machine shops, breweries, etc., and collieries and ironworks in its vicinity. Pop. (1931), 25,954.

**AIRE** (ār). A river of England, W. Riding of Yorkshire, rising to the south-east of Penyghent and flowing in a south-easterly direction to join the Ouse above Goole, having passed through Leeds on its way; length, 70 miles. It is navigable up to Leeds, and forms an important portion of the Aire and Calder Navigation system, which connects Goole, Hull, etc., with Liverpool. The Calder enters the Aire at Castleford. The district specially known as *Airedale* is the valley of the Aire above Leeds.

A large breed of terrier, of which there are several varieties, is known as the **Airedale terrier**, a strongly-built animal, rather long in the legs, with a hard, close coat.

**AIRE.** A river of France, in the Argonne region, a tributary of the Aisne.

**AIR-ENGINE.** An engine in which air heated, and so expanded, or compressed air is used as the motive power. A great many engines of the former kind have been invented, some of which have been found to work pretty well where no great power is required. They may be said to be essentially similar in construction to the steam-engine, though of course the expansibility of air by heat is small compared with the expansion that takes place when water is converted into steam. Engines working by compressed air have been found very useful in mining, tunnelling, etc., and the compressed air may be conveyed to its destination by means of pipes. In such cases the waste air serves for ventilation and for reducing the oppressive heat.

**AIRE-SUR-L'ADOUR** (ār-sûr-là-dör). A small but ancient town of France, department of Landes, the see of a bishop. Pop. 3000.

**AIRE-SUR-LA-LYS** (ār-sûr-là-lē). An old fortified town of France, department of Pas de Calais, 10 miles south-east of St. Omer. Pop. 8200.

**AIROLO** (à-i-rō'lō). A small town of Switzerland, canton Ticino, at the southern end of the St. Gothard Tunnel, and the first place on this route at which Italian is spoken. Pop. 2000.

**AIR-PLANTS,** or **EPIPHYTES.** Are plants that grow upon other plants or trees, apparently without receiving any nutriment otherwise than from the air. The name is restricted to flowering plants (mosses or lichens being excluded) and is suitably applied to many species of orchids. The conditions necessary to the growth of such plants are excessive heat and moisture, and hence their chief localities are the damp and shady tropical forests of Africa, Asia, and America. They are particularly abundant in Java and tropical America.

**AIR-PUMP.** An apparatus by means of which air or other gas may be removed from or compressed into an enclosed space. It was invented by Otto von Guericke of Magdeburg about the year 1654, and described in 1657 by Gaspar Schott. An ordinary suction-pump for water is on the same principle as the air-pump; indeed, before water reaches the top of the pipe the air has been pumped out by the same machinery which pumps the water.

An ordinary air-pump (see fig. 1) consists essentially of a cylinder or barrel with a piston and valves. The barrel is connected to the vessel from which the air is to be pumped. A is the vessel to be exhausted,

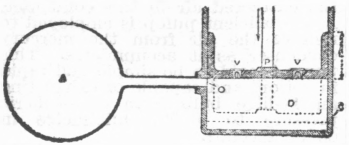


Fig. 1.—Air Pump (sectional view)

C the air-pump cylinder, P the piston, vv valves in the piston, and O the connection to the vessel A. When the piston moves downwards from the position shown, it cuts off the connection with A by passing over O. The length L is made long enough so that O is kept covered up during the downstroke. The air filling the space D is compressed, and so lifts the valves vv and passes out through them. This goes on till the end of the downward stroke, when the volume is very small indeed. When the upward motion begins, the valves vv close, and the piston rises and creates a vacuum in D. When the piston rises sufficiently to uncover O (as in figure), air rushes from A into the highly-exhausted space D and fills it. The process is repeated indefinitely, and A is gradually exhausted.

Air-pumps for compressing air are constructed on the same principle, but the valves act the reverse way. The bicycle pump is a well-known example of this form of pump. In the Fleuss or Geryk pump greater efficiency is attained by having layers of oil in the barrel and above the piston.

In nearly all pumps for producing the high vacua necessary, e.g. for the electric glow-lamp and the X-ray tube, mercury is employed. In one form, the Toepler pump, a reservoir containing mercury is connected by a flexible tube to the receiver. (See fig. 2. T, tube connecting pump to vessel to be exhausted; R, reservoir, raised above A to drive air in B and C through D and out into open air; R is then lowered, and B and C fill with air from receiver. Process then repeated.) By alternately lowering and raising the reservoir, gas is first withdrawn from the receiver and then expelled through D, which also acts as a barometer. The process is repeated until the desired degree of exhaustion is reached.

In a second type, the Sprengel pump, a stream of mercury from a reservoir situated above the vessel to be exhausted falls in drops through a narrow vertical tube which communicates with the vessel. (See fig. 3. A, reservoir; B, tube leading to vessel to be exhausted; C, bubbles of air carried down by mercury.) The air is entrapped between the falling drops of mercury, and is carried down and expelled with it. In the filter-pump, water is used instead of mercury, the pump being connected to an ordinary water-tap.

A more recent form, the Gaede pump, is of the rotary type. (See fig. 4. C, iron case; G, glass front; P, two-chamber porcelain drum rotated counter-clockwise about axle A. As mercury leaves chamber R, air enters from receiver by tube T and

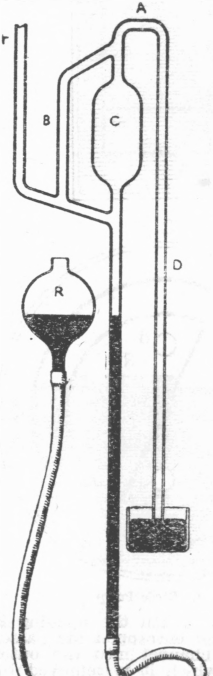



Fig. 2
Toepler Pump

Fig. 3
Sprengel Pump

opening B. When B is immersed, mercury enters and air is driven into case C and removed through tube S.)

A porcelain drum, divided into two cells, rotates within an air-tight case more than half filled with mercury. Each cell has an opening which, when above the mercury surface, places the cell in communication with

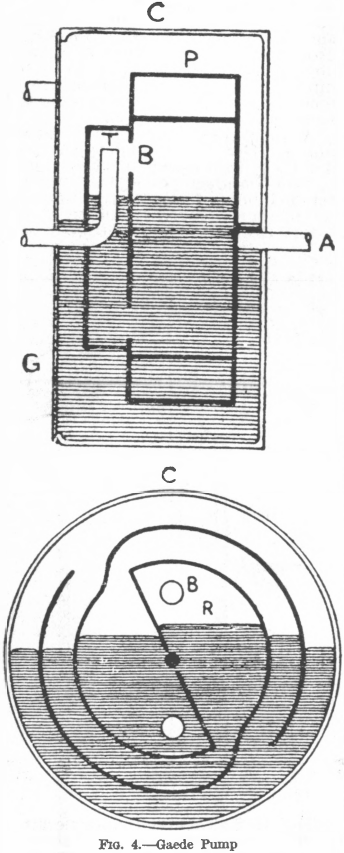



Fig. 4.—Gaede Pump

the receiver. When the opening is immersed, the entrapped air passes by another channel into the outer case, from which it is removed by another less efficient pump. The pump will reduce the pressure within a 6-litre bulb from 10 millimetres to .00001 millimetre of mercury in fifteen minutes.

Langmuir's pump employs the principle of the aspirator. A current of mercury vapour passes from a mercury boiler past a tube communicating with the apparatus to be exhausted, and sucks the air from it; the mercury is condensed in the upper part of the pump, returns by side tubes to the boiler and leaves the extracted air in this condenser. A less efficient pump is employed to remove the air from the mercury condenser as it accumulates. This pump is said to be simple and rapid in action, and capable of exhausting an 11-litre bulb from atmospheric pressure to .00001 millimetre in eighty seconds.

Air-pumps are largely used in steam engineering, both on land and at sea, to extract the air which enters the condenser with the steam (*see* Condenser). Several varieties of air-pumps are in use.

1. The ordinary piston-pump (fig. 1) in which the piston extracts air by first sucking it into the cylinder and then expelling it to the atmosphere. The opening leading to the condenser is closed during the stroke in which the air is expelled. Two or three cylinders are usually provided on each air-pump set, the former type being known as a 2-throw pump and the latter a 3-throw pump. One of the best-known makes is the *Edwards* air-pump. Piston air-pumps are driven either by the main engine through a suitable mechanism, or by a separate electric motor. The amount of power required to drive them varies with the size of the set, and with large engines of over 10,000 h.p. it is about ½ per cent or less. Vacua as high as 29 inches (Bar. 30 inches) can be readily maintained on large plants by this type of pump, provided the condenser is suitably designed. In well-maintained plants bad vacua are commonly due to deficient air extraction, which may arise from the low-pressure air-piping not being air-tight, or from the air-pump being too small.

2. The water-ejector type uses the momentum of a jet of water to extract the air entrained with it. Well-known types of this plant are the ordinary barometric jet-condenser and the *Leblanc* air-pump. In the latter type, a rotating wheel, which carries vanes, forcibly throws sheets of water into a pipe communicating with the condenser. The sheets of water lie across the pipe, and the space between them is filled up with air sucked from the condenser. This water, with the entrained air, is thrown out, against the atmospheric pressure, by the momentum imparted to the water sheets by the rotating wheel. Very high vacua can be

obtained with the Leblanc pump, but the power required to drive it is more than is required with a 3-throw piston-pump. (Cp. Sprengel pump above).

3. A steam-ejector is also used, a jet of steam taking the place of the sheets of water in the Leblanc type. Parsons' *augmentor condenser* works on this principle. A small jet of steam sucks the air from the main condenser and compresses it into a small so-called augmentor condenser. The pressure in this condenser is a little higher than the pressure in the main condenser, but it is sufficient to enable an ordinary 3-throw pump to be used efficiently. The steam used to extract the air is condensed in the augmentor condenser by cold water, and the interior of the augmentor condenser is connected to the inlet of an ordinary 3-throw pump. The 3-throw pump is called upon to deal with the air at a slightly higher pressure than the condenser pressure, and the vacuum in the main condenser is improved by the drop of pressure which exists between the augmentor condenser and the main condenser. In a well-designed plant, for instance, a 3-throw pump might be used to maintain a vacuum of 29 inches in the augmentor condenser, while the steam jet would provide another ½ inch of vacuum, giving 29½ inches vacuum in the main condenser. The *pressure* in the main condenser is thereby reduced from 1 inch Hg. to ½ inch Hg.; a reduction of *one-half*. (Cp. Langmuir's pump above—using a mercury-vapour jet instead of a steam jet.)—BIBLIOGRAPHY: S. P. Thompson, *The Development of the Mercurial Air-Pump*; E. Hausbrand, *Evaporating, Condensing, and Cooling Apparatus*.

**AIR-RAIDS.** Apart from various sporadic bomb-dropping attacks by the Italians in Tripoli in 1913, the first air-raid proper was made by a Zeppelin on Antwerp during the investiture of that city by the Germans in 1914. Later on this new method of warfare was developed to a considerable extent by both sides during the Great European War, both air-ships and aeroplanes being used. Air-craft for this purpose have been likened to long-range guns, with the advantage of greater precision, because the target is in view, and very much longer effective range—the Germans, for example, used to raid London, and on one occasion Edinburgh, from bases situated in North Germany and on the Schleswig coast. Air-raids are of great value in affecting the *moral* of the enemy country by bringing home the effects of war in its most terrifying aspect to the civilian population at home, and thus causing the dislocation of traffic and diminishing the output of munitions. Their practical value is in attacking and destroying munition-factories, army headquarters, naval bases, etc., in addition to such important work as the demolition of ammunition-dumps, and cutting lines of communication behind the front.

Various protective devices against raiding aircraft have been invented. Among these are high-angle guns, capable of throwing shells to a height of some 30,000 feet, though possibly the most effective defence is small high-speed aeroplanes armed with machine-guns and capable of reaching great heights in a short space of time. For use at night, kite-baloons (*see* BALLOONS) are sent up in clumps connected together by cables. From the cables is suspended a network of steel wires, which is invisible to the hostile air-craft, and in which they may become entangled and so brought down. These have been raised to a height of as much as 12,000 feet. For raiding purposes two types of aeroplane—in addition to air-ships—have been developed. "Day bombers" carry out raids in daylight at heights of 12,000 to 20,000 feet on points from 50 to 100 miles behind the lines. "Night-bombers" are slower machines which raid well into the enemy's territory—up to 200 or more miles—at heights varying from 8000 to 12,000 feet. It is usual for night-raids to be carried out by squadrons of machines flying in formation, each machine carrying about a ton of bombs (in 1918). Air-ships can carry 5-10 tons of bombs to places up to 1000 miles distant from their bases.

During the last months of the war, our Independent Air Force dropped 500 tons of bombs on German objectives, and this raiding over a wide area of industrial Germany played no small part in causing that loss of spirit among the enemy which led eventually to their request for an armistice, and their virtual capitulation.

**AIR-SHIPS.** Lighter-than-air craft provided with means of propulsion and steering. The air-ship, unlike the aeroplane, is not dependent upon its engines for its power to remain in flight, but derives its sustentation from the hydrogen gas with which it is filled.

Hydrogen, first weighed by Henry Cavendish in 1766, is the lightest gas known, being 14.47 times lighter than air. In the pure state it has a lifting force of 71.155 lb. per 1000 cu. feet, but for calculation purposes is usually

assumed to contain 5 per cent of impurities, giving a "lift" of approximately 68 lb. per 1000 cu. feet. Hydrogen is, when mixed with air, highly inflammable, and helium has therefore been suggested as a substitute. This has a lift, when pure, of about 65 lb. per 1000 cu. feet, but is only found in a few places in America and is therefore at present too expensive to be used in quantities. The lift of any given quantity of hydrogen depends upon the difference between its weight and that of an equal volume of air. As the amount, and therefore weight, of air contained in a given space varies with the barometric pressure and temperature, the lift of hydrogen given above varies also.

These figures are based upon a temperature of 60° F. and a barometric pressure of 30 inches. As an air-ship rises from the ground, the density, and therefore pressure, of the air decreases, which causes the hydrogen in the envelope to expand proportionately. Rise in temperature has the same effect. When an air-ship ascends, the gas therefore expands, and at a certain point would burst the envelope were valves not provided to allow some of the gas to escape. It is important to realise that as the expansion occurs at a rate corresponding to the decrease in density no alteration in lift occurs so long as gas is not lost through the valves. This would continue indefinitely if the gas-chamber were capable of stretching indefinitely, but with the cotton-fabric used in practice a height is reached when gas commences to escape from the automatic valves. From this moment the lift of the air-ship begins to decrease. At a certain point this decrease will have reached such a point that the air-ship is "in equilibrium," i.e. she weighs precisely the same as the volume of air she displaces. This is known as the "maximum height." Up to 10,000 feet it is roughly true that 1/30 of the lift is lost per 1000 foot rise.

The simpiest form of air-ship is the *non-rigid*, which consists of a rubberised cotton-fabric gas-container (the "envelope"), from which the "car," containing engines, crew, etc., is hung by flexible steel-wire ropes. To resist the bending moment introduced by the weight of the car, the envelope is inflated with hydrogen under pressure—usually about 25 mm. of water. So long as this pressure is greater than any local compression due to bending or loading in the fabric, the envelope will retain its shape. On coming down from a height, owing to the loss of gas, as already explained, the pressure will be reduced, and something must be done to restore it or the envelope will buckle. Fabric bags, known as "ballonets," are therefore fitted inside the envelope, and as the air-ship descends air is forced into these bags, which supplies the lost pressure and maintains the shape of the envelope. The height to which a non-rigid air-ship can go, on returning from which the ballonets will be just full of air and the pressure the same as at starting, is known as the "maximum ballonet height." Ballonets are usually equivalent in volume to rather less than a quarter of the total volume of the air-ship—giving a maximum ballonet height of 6000 to 7000 feet. Usually from two to three ballonets are provided, according to the size of the air-ship.

During the Great European War British non-rigid air-ships were constructed varying in size from a capacity of 70,000 cu. feet to 360,000 cu. feet. The former had one 75-h.p. engine, and the latter two of 375 h.p. each. Owing to difficulties in maintaining the shape and distributing the weight of the car over a long envelope, it is generally considered that 500,000 cu. feet probably represents the maximum size in which the non-rigid form of construction can be used. Above this size the *semi-rigid* type is used. In this case the envelope remains as in the non-rigid, but a girder or "keel" is introduced between the envelope and the car, the weight of which is therefore taken by the keel and thence distributed to the envelope instead of being taken direct from the envelope as in non-rigids.

There has been little development of non-rigids in Great Britain. The most prominent types are the Italian "Forlanini," "Verduzzio," and military air-ships. The keel, in all these examples, is not a rigid girder in the vertical sense, as it consists of a number of sections connected together by links. It is designed to resist compression only so long as it is held straight by the pressure of the envelope, and is not capable of taking a bending moment. When a size of about 1,000,000-cu.-foot-hydrogen capacity is reached it becomes economical to use the *rigid* method of construction. This is totally distinct from the other two types, as the non-rigid envelope is replaced by a rigid hull of sufficient strength to retain its shape without the assistance of any internal gas-pressure. The hull consists of a number of longitudinal members—usually built-up girders of "duralumin," an aluminium alloy—con-

nected together at distances of 25-30 feet by a number of "transverse frames," or rings, forming bulkheads. The transverse frames are also of duralumin girders, and are braced by "radical wires" running from the joints of these girders to a ring in the centre. Between each pair of these transverse frames is a gas-bag containing hydrogen. The gas-bags are made of rubberized cotton on to which is stuck "gold-beater's skin," made from the lining of the intestines of an ox. This is done to prevent hydrogen leakage. This is necessary, as the fabric of the gas-bags of a rigid air-ship is lighter and contains less rubber than the envelope of a non-rigid.

A "Δ"-shaped keel runs along the interior of the ship, its weight being taken on the two bottom longitudinal girders. The chief function of the keel is to distribute the load of the various weights to the transverse frames of the air-ship. In it are slung the petrol-tanks, water-ballast tanks, bombs, etc., and living accommodation for the crew is also provided there. Along the bottom runs a walking-way from which access is gained to the cars and various parts of the air-ship. The cars containing the engines, wireless-cabin, and pilot's cabin are suspended from the transverse frames. Some of the cars, instead of being slung below the centre-line, are slung in pairs some little way up the side of the air-ship.

All air-ships are steered by means of rudders and, in the vertical sense, elevators, in precisely the same way as aeroplanes. Speeds of over 84 miles per hour have been reached. Amongst the most notable non-stop flights are the trans-Atlantic journeys of the German-built ZR3 (5000 miles in 81 hours) and of the British R34, which made the return passage in 75 hours. The North Pole was crossed by Amundsen in the *Norge* in 1926, and by Nobile in the ill-fated *Italia* in 1928. The German *Graf Zeppelin* flew round the world in 21 days in 1929, and the British R100 flew to Canada and back in 1930. On 5th Oct., 1930, the British R101, while on a flight to India, crashed near Beauvais in France and was completely wrecked. 48 lives were lost. The American Zeppelin, the *Akron*, capable of a speed of 47 miles per hour, was caught in a thunderstorm and crashed into the sea off the New Jersey coast on April 4, 1933. *See also* AERONAUTICS; BALLOONS.

**AIRY, Sir George Biddell.** A distinguished English astronomer, was born at Alnwick, 27th July, 1801, and educated at Hereford, Colchester, and Trinity College, Cambridge, where he was senior wrangler in 1823. At Cambridge he was Lucasian professor of mathematics, and subsequently Plumian professor of astronomy and experimental philosophy, in the latter capacity having charge of the observatory. In 1835 he was appointed Astronomer Royal, and as such his superintendence of the observatory at Greenwich was able and successful. He resigned this post with a pension in 1881. His important achievement is the discovery of a new inequality in the motions of Venus and the earth. He wrote much and made numerous valuable investigations on subjects connected with astronomy, physics, and mathematics. Among separate works published by him may be mentioned *Popular Astronomy, On Sound and Atmospheric Vibrations, A Treatise on Magnetism, On the Undulatory Theory of Optics, On Gravitation.* He died 2nd Jan., 1892. He left an autobiography, published in 1896.

**AISLE** (īl; from Lat. *ala*, a wing). In architecture, one of the lateral divisions of a church in the direction of its length, separated from the central portion or nave by piers or pillars. There may be one aisle or more on each side of the nave. The cathedrals at Chichester, Milan, and Amiens have five aisles, Antwerp and Paris seven, and that of Cordova nineteen aisles in all. The nave is sometimes called the central aisle. *See* CATHEDRAL.

**AISNE** (ān). A north-eastern frontier department of France; area, 2866 sq. miles. It is an undulating, well-cultivated, and well-wooded region, chiefly watered by the Oise in the north, its tributary the Aisne in the centre, and the Marne in the south. It contains the important towns of St. Quentin, Laon (the capital), Soissons, and Château Thierry. In the European War (1914-18) severe fighting took place on the Aisne, and a great battle was fought on 12th Sep., 1914. General Nivelle's offensive on the Aisne began in April, 1917. Pop. 489,368.

**AĬVA'LĬK, or KIDONIA.** A seaport of Asia Minor, on the Gulf of Adramyti, 66 miles north by west of Smyrna, carrying on an extensive commerce in olive-oil, soap, cotton, etc. Pop. 21,000.

**AIX** (āks). A town of Southern France, department Bouches-du-Rhône, on the River Arc, the seat of an archbishop. It is well built, has an old cathedral and other interesting buildings, including a university, a

library (over 100,000 vols.), museum, etc.; manufactures cotton and woollen goods, oil, soap, hats, flour, etc.; warm springs, now less visited than formerly. Aix was founded in 123 B.C. by the Roman consul Gaius Sextius Calvinus, and from its mineral springs was called *Aquæ Sextiæ* (Sextian Waters). Between this town and Arles, Marius gained his great victory over the Teutons, 102 B.C. In the Middle Ages the counts of Provence held their court here, to which the troubadours used to resort. Pop. 38,332.

**AIX, or AIX-LES-BAINS** (āks-lā-ban). A finely-situated village of France, department of Savoie, 9 miles by rail north of Chambéry, on the side of a fertile valley, with much-frequented hot springs known to the Romans by the name of *Aquæ Gratianæ*, and with ruins of a Roman triumphal arch, and of a temple of Diana. Pop. 8900.

**AIX-LA-CHAPELLE** (āks-lå-shå-pel; Ger. *Aachen*). A city of Rhenish Prussia, 44 miles west by south of Cologne, pleasantly situated in a fine vale watered by the Wurm, formerly surrounded by ramparts, now converted into pleasant promenades. It is well built, and though an ancient town has now quite a modern appearance.

The most important building is the cathedral, the oldest portion of which, often called the nave, was erected in the time of Charles the Great (Charlemagne) as the palace chapel about 796. It is in the Byzantine style, and consists of an octagon, surrounded by a sixteen-sided gallery and surmounted by a cupola, in the middle being the tomb of Charlemagne. The adjoining Gothic choir, begun in 1353 and finished in 1413, forms the other chief division of the cathedral; it is lofty and of great elegance, and has fine painted windows. Another noteworthy building is the Rathaus (town hall), erected in the fourteenth century.

**Products.** Aix-la-Chapelle, with the adjoining Burtscheid, which may be considered a suburb, is a place of great commerce and manufacturing industry, the chief productions being woollen yarns and cloths, needles, machinery, cards (for the woollen manufacture), railway and other carriages, cigars, chemicals, silk goods, hosiery, glass, soap, etc. A considerable portion of its importance and prosperity arises from the influx of visitors to its sulphur and chalybeate springs and baths.

**History.** Aix-la-Chapelle was known to the Romans as *Aquisgranum*. It was the favourite residence of Charles the Great, who made it the capital of all his dominions north of the Alps, and who died here in 814. During the Middle Ages it was a free imperial city and very flourishing. Thirty-seven German emperors and eleven empresses have been crowned in it, and the imperial insignia were preserved here till 1795, when they were carried to Vienna. The town was in possession of France from 1794 to 1814. Pop. 155,816.

**Congress of Aix-la-Chapelle.** A congress held in 1818, by which the army of the allies in France was withdrawn after France had paid the contribution imposed at the peace of 1815, and by which independence was restored to France.—A *treaty* of peace concluded at this city, 2nd May, 1668, as a result of the Triple Alliance, put an end to the war carried on against Spain by Louis XIV. in 1667, after the death of his father-in-law, Philip IV., in support of his claims to a great part of the Spanish Netherlands, which he urged in the name of his queen, the infanta Maria Theresa. By this France obtained Lille, Charleroi, Douai, Tournai, Oudenarde, etc. The *second peace* of Aix-la-Chapelle, 18th Oct., 1748, terminated the Austrian war of succession.

**AJACCIO** (å-yàch'ō). The capital of Corsica, on the south-west coast of the island, on a tongue of land projecting into the Gulf of Ajaccio, the birthplace of Napoleon and the seat of a bishop, with coral and sardine fisheries, and a considerable trade. There are here a cathedral, a college with library and museum, marble statue of Napoleon, monument of the Bonaparte family, etc. Ajaccio is connected by railway with Bastia and other places, and is becoming a winter resort for people with weak lungs. Pop. 23,917.

**AJAN'TA.** A village and ravine of India, in the north-west of the Nizam's dominions, about 50 miles north-north-east of Aurangabad. The ravine, 4 miles N.W. of the village, is celebrated for its cave temples and monasteries, twenty-nine in number, excavated out of a wall of almost perpendicular rock about 250 feet high. They are all richly ornamented with sculpture, and covered with highly-finished paintings, representing subjects of almost all kinds. The oldest are assigned to about 200 B.C., the most modern to about A.D. 600, and they may be said to furnish a continuous record of Buddhist art during 800 years, the faith at the latter date being practically expelled from India.

**A'JAX** (Gr. *Aias*). The name of two Grecian chiefs who fought against Troy, the one being son of Oileus, King of Locris, surnamed the Little, the other son of Telamon, the Great or Telamonian Ajax. The latter was from Salamis, and sailed with twelve ships to Troy, where he is represented by Homer as the boldest and handsomest of the Greeks, after Achilles. He had more than one combat with Hector, against whom he was well matched. On the death of Achilles, when his arms, which Ajax claimed, were awarded to Ulysses, he became insane and killed himself. This is the subject of Sophocles' tragedy *Ajax*. The other Ajax was hardly of less importance as a champion on the Greek side in the Trojan war. At the fall of Troy he entered the temple of Pallas Athena and seized Cassandra. He lost his life during his homeward voyage, either by shipwreck or by a flash of lightning sent by Athena, who was offended at the violation of her temple.

**AJMER-MERWARA,** or **AJMER.** A British commissionership or province in India, Rajputána, divided into the two districts of Ajmer and Mairwara (or Merwara); area, 2711 sq. miles. The surface of the province, which is entirely surrounded by native States, is hilly in the north and west, where there is a branch of the Aravali range, but level in the south and east. The soil is partly fertile, but there are large barren sandy plains, and there are no rivers of any importance. There are a large number of tanks which collect the water of small streams, and are useful for irrigation. The province suffered severely from famine in 1899-1900, the population being reduced by 12 or 13 per cent. Pop. 560,292.

**Ajmer,** the capital, an ancient city, a favourite residence of the Mogul emperors, is 279 miles S.W. of Delhi, at the foot of Taragarh Hill (2853 feet), on which is a fort. It is surrounded by a wall, has well-built streets, and possesses a Government college, as also Mayo College for Rajput nobles, a Scottish mission, a mosque that forms one of the finest specimens of early Mahommedan architecture extant, and an old palace of Akbar, now the treasury. There is a trade in cotton, sugar, salt, etc., and the town is an important station on the Rajputána railway. Pop. 119,524.

**AJOWAN'** (*Ptychōtis Ajowan*). An umbelliferous plant cultivated in India, Persia, and Egypt, the seeds of which are used in cookery and in medicine, having carminative properties. The seeds much resemble caraway seeds, have a strong smell of thyme, and are exported in some quantity to Europe as a source of *thymol*, now so well known.

**AJU'GA.** A genus of plants belonging to the labiate family. *See* BUGLE.

**AJ'UTAGE.** A short tube of a tapering shape fitting into the side of a reservoir or vessel to regulate the discharge of water from it. Also, the nozzle of a tube for regulating the discharge of water to form a *jet d'eau*.

**AKABAH', Gulf of.** An arm of the Red Sea, on the east side of the Peninsula of Sinai, which separates it from the Gulf of Suez; nearly 100 miles long. The village of Akabah, at the northern extremity of the gulf, is supposed to be near the site of the *Ezion-geber* of the Old Testament. It has been included in Transjordan since 1925 and is now the port of that country.

**AKAGAMASEKI.** *Same as* SIMONOSEKI.

**AKAROID RESIN.** A resin obtained from some of the grass-trees of Australia, used in varnishes.

**AKASSA.** A seaport of Southern Nigeria, on a small island nearly opposite the chief mouth of the Niger. There are here engineering and other works, at which ships may be repaired, belonging to the Government.

**AK'BAR** (that is "very great"). A Mogul emperor, the greatest Asiatic prince of modern times. He was born at Amerkote, in Sind, in 1542, succeeded his father, Humayun, a grandson of Sultan Baber, at the age of thirteen, and governed first under the guardianship of his minister, Beyram, but took the chief power into his own hands in 1560. He fought with distinguished valour against his foreign foes and rebellious subjects, conquering all his enemies, and extending the limits of the empire farther than they had ever been before, although on his accession they embraced only a small part of the former Mogul Empire. Although a Mohammedan by birth, he abandoned Islam and founded a new religion which he called "Divine Faith" (*Diu-i-Olahi*). His contemporaries bestowed upon him the title of "Guardian of Mankind." He was also a generous patron of literature, and commissioned the Jesuit missionary, Jerome Xavier, to translate the four gospels into Persian. His government was remarkable for its mildness and tolerance towards all sects; he was indefatigable in his

attention to the internal administration of his empire, and instituted inquiries into the population, character, and productions of each province. The result of his statistical labours, as well as a history of his reign, were collected by his minister, Abul Fazl, in a work called *Akbar-Nameh* (Book of Akbar), the third part of which, entitled *Ayini-Akbari* (Institutes of Akbar), was published in an English translation at Calcutta (1783-6, 3 vols.), and reprinted in London. He died in 1605. His mausoleum at Secundra, near Agra, is a fine example of Mohammedan architecture. Cf. V. A. Smith, *Akbar, The Great Mogul*.

**A KEMPIS, Thomas.** *See* THOMAS À KEMPIS.

**AKEN** (ä'ken). A Prussian town, province of Saxony, on the left bank of the Elbe, with manufactures of tobacco, cloth, beetroot sugar, leather, etc. Pop. 7358.

**A'KENSIDE, Mark.** A poet and physician, born in 1721, at Newcastle-upon-Tyne, died in London in 1770. He was the son of a butcher, and was sent to the University of Edinburgh to qualify for the ministry, but chose the study of medicine instead. After three years' residence at Edinburgh he went to Leyden, and in 1744 became Doctor of Physic. In the same year he published the *Pleasures of Imagination*, which he is said to have written in Edinburgh, and which was translated into French by Baron d'Holbach (1769). In 1746 he wrote his much-praised *Hymn to the Naiads*. Having settled in London, he became a fellow of the Royal Society, and was admitted into the College of Physicians. In 1759 he was appointed first assistant and afterwards head physician to St. Thomas's Hospital. In his later days he wrote little poetry, but published several medical essays and observations. The place of Akenside as a poet is not very high, though Dr. Johnson praised the blank verse of his poems, and his somewhat cumbrous *Pleasures of Imagination* was once considered one of the most pleasing didactic poems in our language.

**AKHALZIK,** or **ACHALZIK** (ä-hâl'tsik). A town of Russia in Asia, in the Trans-Caucasian government of Tiflis, 97 miles west of Tiflis, with a citadel. It was taken by the Russians in 1828. Pop. 15,320.

**AK'HENA'TON,** or **IKHENATON, Amenhotep 4th.** Pharaoh of Egypt about 1375 B.C. He is renowned for the amazing religious revival he instituted when he upset the old worship of Amon Ra, and introduced the new cult of Aton, the sun, represented as the Divine Origin of All Life.

**AK-HISSAR** (" white castle "). A town in Turkey, 50 miles N.E. of Smyrna, occupying the site of the ancient Thyatira, relics of which city are here abundant. Here the Emperor Valens defeated the usurper Procopius in 366, and Murad defeated the Prince of Aïdin in 1425. Pop. 18,026.

**AKHTYRKA** (äh-tir'kä). A cathedral town of the Ukraine, government of Kharkov, with a good trade and some manufactures. Pop. 25,750.

**AKJERMANN** (äk-yer-män'). *Same as* AKKERMANN.

**AKKAD.** The northern portion of ancient Babylonia occupied by the earliest Semitic invaders when the southern portion was Sumer (or Sumeria) and occupied by non-Semites. There was also a city of the same name, the Biblical Accad (Gen. x.), which was prominent before 2000 B.C. Its ruins were unearthed between 1917 and 1919. *See* BABYLONIA.

**AKKAS.** A dwarfish race of Central Africa, dwelling in scattered settlements to the north-west of Lake Albert Nyanza, about lat. 3° N., lon. 29° E. Their height averages about 4½ feet; they are of a brownish or coffee colour; head large, jaws projecting (or prognathous), ears large, hands small. They are timid and suspicious, and live almost entirely by the chase, being exceedingly skilful with the bow and arrow. They were first seen by the traveller G. A. Schweinfurth in 1870.

**AKKERMANN'.** A fortified town and seaport in Bessarabia, near the mouth of the Dniester, with a good port. The vicinity produces quantities of salt, and also fine grapes from which excellent wine is made. A treaty was signed here, 6th Oct., 1826, between Russia and the Porte, by which Moldavia, Walachia, and Serbia were released from all but nominal dependence on Turkey. Pop. 33,495.

**AKMOLINSK'.** A Russian province in Central Asia, largely consisting of steppes and wastes; the chief rivers are the Ishim and Sari-Su; and it contains the larger part of Lake Balkash. Capital, Omsk. Area, about 225,070 sq. miles. Pop. 1,523,700.—Akmolinsk is a place of some importance for its caravan trade. Pop. 10,000.

**AKO'LA.** A town of India, in Berar, the residence of the commissioner of Berar, on the River Morna,

150 miles W. by S. of Nagpur; with walls and a fort, and some trade in cotton. Pop. 37,864.

**AK'RON.** A town of the United States, in Ohio, 100 miles N.E. of Columbus, on an elevated site. Being furnished with ample water-power by the Little Cuyahoga, it possesses large flour-mills, woollen factories, manufactures of iron goods, etc. In the vicinity extensive beds of mineral paint are worked. Pop. 255,040.

**AKSU'** (" white water "). A town of Eastern or Chinese Turkistan, 300 miles from Kashgar, in the valley of the Aksu. It is an important centre of trade between Russia, China, and Tartary, and has manufactures of cotton cloth, leather, and metal goods. Formerly the residence of the kings of Kashgar and Yarkand. Pop. 20,500.

**AKYAB'.** A seaport of Lower Burma, capital of the province of Arracan, at the mouth of the River Kuladan or Akyab, of recent upgrowth, well built, possessing a good harbour, and carrying on an important trade, its chief exports being rice and petroleum. Pop. 36,569.

**AL.** The article in the Arabic language. It appears in English words derived from the Arabic, such as Algebra, Alchemy, Alcove.

**ALABAMA** (al-a-bá'ma). One of the United States, bounded by Tennessee, Georgia, Florida, the Gulf of Mexico, and Mississippi; area, 51,998 sq. miles. The southern part, bordering on the Gulf of Mexico and Florida, is low and level, and wooded largely with pine, hence known as the " pine-woods region "; the middle is hilly, with some tracts of level sand or prairies; the north is broken and mountainous. The State is intersected by the Rivers Alabama, Tombigbee, Mobile, Coosa, Tallapoosa, Tennessee, etc., some of them navigable for several hundred miles. The soil is various, being in some places, particularly in the south, sandy and barren, but in most parts is fertile, especially in the river valleys and in the centre, where there is a very fertile tract known as the " cotton belt."

**Climate.** It is generally warm, and in the low-lying lands skirting the rivers rather unhealthy. In the more elevated parts it is healthy and agreeable, the winters being mild and the summers tempered by breezes from the Gulf of Mexico.

**Products.** The staple production is cotton, especially in the middle and south, where rice and sugar are also grown; in the north the cereals (above all maize) are the principal crops. Alabama possesses extensive beds of iron ore and coal, with marble, granite, and other minerals; and coal and iron mining, and the smelting and working of iron, are now important industries. The manufacture of cotton goods is extensively carried on. The foreign trade is concentrated in Mobile, whence cotton is the principal export.

The State sends eight representatives to Congress. Its principal towns are Montgomery, the seat of government, and Mobile, the chief port. There is a State university at Tuscaloosa, a university connected with the Methodist Episcopal body, several State normal colleges, besides professional schools, etc., in the principal towns. Alabama became a State in 1819. It was one of the slave States. Pop. 2,646,248 (including 900,652 negroes).

**ALABAMA.** A river of the United States, in the State of Alabama, formed by the junction of the Coosa and the Tallapoosa. After a course of 300 miles it joins the Tombigbee and assumes the name of the Mobile.

**ALABAMA, The.** A ship built at Birkenhead to act as a privateer in the service of the Confederate States of North America during the civil war begun in 1861. She was a wooden screw steamer with two engines of 350 h.p. each, 1040 tons burden, and carried eight 32-pounders. Before she was launched her destination was made known to the British Government, but owing to some legal formalities the orders given for her detention did not reach Liverpool till the day after she had left that port (29th July, 1862). She received her armament and stores at the Azores, and entered on her destructive career, capturing and burning merchant vessels, till she was sunk in a fight with the Federal war steamer *Kearsarge*, off Cherbourg, 19th June, 1864.

As early as the winter of 1862 the United States Government declared that they held themselves entitled at a suitable period to demand full compensation from Britain for the damages inflicted on American property by the *Alabama* and several other cruisers that had been built, supplied, or recruited in British ports or waters. After a long series of negotiations it was agreed to submit the final settlement of the question to a court of arbitration, consisting of representatives of Britain and the United States, and of three other members, appointed by the King of Italy, the President of Switzerland, and the Emperor of Brazil. This

court met at Geneva, 17th Dec., 1871, and a claim for indirect damages to American commerce having been abandoned by the United States Government, the decree was given in Sept., 1872, that Britain was liable to the United States in damages to the amount of 15,500,000 dollars (about £3,229,200). After all awards were made to private claimants about 8,000,000 dollars still remain unclaimed.

**ALABANDITE,** or **MANGANBLENDE.** A black submetallic mineral.

**ALABAS'TER.** A name applied to a granular variety of gypsum or hydrated sulphate of lime. It was much used by the ancients for the manufacture of ointment and perfume boxes, vases, and the like. It has a fine granular texture, is usually of a pure white colour, and is so soft that it can be scratched with the nail. It is found in many parts of Europe; in great abundance and of peculiarly excellent quality in Tuscany. From the finer and more compact kinds, vases, clock-stands, statuettes, and other ornamental articles are made, and from inferior kinds the cement known as plaster of Paris. A variety of carbonate of lime, closely resembling alabaster in appearance, is used for similar purposes under the name of *Oriental alabaster*. It is usually stalagmitic or stalactitic in origin and is often of a yellowish colour. It may be distinguished from true alabaster by being too hard to be scratched with the nail.

**ALAC'TAGA** (*Alactăga jacŭlus*). A rodent mammal, closely allied to the jerboa, but somewhat larger in size, with a still longer tail. Its range extends from the Crimea and the steppes of the Don across Central Asia to the Chinese frontier.

**ALAGO'AS.** A martime State of Brazil; area, 22,577 sq. miles; pop. 1,189,214—**Alagoas,** the former capital of the province, is situated on the south side of an arm of the sea, about 15 miles distant from Maceio, to which the seat of government was transferred in 1839. Pop. 15,326.

**ALAIS** (à-lā). A town of Southern France, department of Gard, 87 miles N.W. of Marseilles, with coal, iron, and lead mines, which are actively worked, and chalybeate springs, which have many visitors during the autumn months. The treaty of Alais, signed on 28th June, 1629, ended the Huguenot wars in France. Pop. 36,455.

**ALAJUELA** (à-là-ĥu-ā'là). A town of Central America, in the State of Costa Rica. Pop. 13,737.

**ALA-KUL.** A lake in Russian Central Asia, near the borders of Mongolia, in lat. 46° N. lon. 81° 40′ E.; area, 660 sq. miles.

**ALAMANNI.** *See* ALEMANNI.

**AL'AMO.** A fort in Bexar county, Texas, United States, celebrated for the resistance its occupants (140 Texans) made to a Mexican force of 4000 from 23rd Feb. to 6th March, 1836. At the latter date only six Texans remained alive, and on their surrendering they were slaughtered by the Mexicans.

**AL'AMOS.** A town of Mexico, State of Sonora, the capital of a mining district. Pop. 12,000.

**ÅLAND** (o'land) **ISLANDS.** A numerous group of islands and islets, about eighty of which are inhabited, belonging to Finland, situated in the Baltic Sea near the mouth of the Gulf of Finland; area, 551 sq. miles. The principal island, Åland, distant about 30 miles from the Swedish coast, is 18 miles long and about 14 broad. The fortress of Bomarsund, here situated, was destroyed by an Anglo-French force in Aug., 1854. The inhabitants, who are of Swedish extraction, employ themselves mostly in fishing. The islands were ceded by Sweden to Russia in 1809, and proclaimed a province of Finland in 1918. An unofficial referendum, taken in Dec., 1918, decided in favour of union with Sweden, but on 22nd Oct., 1921, an agreement for the neutralisation of the islands was signed at Genoa. They still remain Finnish. Pop. 27,093.

**AL'ARIC I.** King of the Visigoths, was born about the middle of the fourth century, probably in 370, and is first mentioned in history in A.D. 394, when Theodosius the Great gave him the command of his Gothic auxiliaries. The dissensions between Arcadius and Honorius, the sons of Theodosius, inspired Alaric with the intention of attacking the Roman Empire. In 396 he ravaged Greece, from which he was driven by the Roman general Stilicho, but made a masterly retreat to Illyria, of which Arcadius, frightened at his successes, appointed him governor. In 400 he invaded Italy, but was defeated by Stilicho at Pollentia (403) and induced to transfer his services from Arcadius to Honorius on condition of reciving 4000 lb. of gold. Honorius having failed to fulfil this condition, Alaric made a second invasion of Italy, during which he besieged Rome three times. The first time (408) the city was saved by paying a heavy ransom; the second (409) it

capitulated, and Honorius was deposed, but shortly afterwards restored. His sanction of a treacherous attack on the forces of Alaric brought about the third siege, and the city was taken 24th Aug., 410, and sacked for six days, Alaric, however, doing everything in his power to restrain the violence of his followers. He quitted Rome with the intention of reducing Sicily and Africa, but died at Cosenza in 410. Legend has it that he was buried beneath the river-bed of the Busenzo, the course of which was temporarily turned aside for the purpose.

**ALARM.** In military language, a signal, given by beat of drum, bugle-call, or firing of a gun, to warn a camp or garrison of a surprise intended or actually made by the enemy. A place, called the **alarm-post,** is generally appointed at which the troops are to assemble when an alarm is given.

**Alarm** is also the name given to several contrivances in which electricity is made use of, as a **fire-alarm,** by which intelligence is at once conveyed to the proper quarter when a fire breaks out; a **burglar-alarm,** an arrangement of wires and a battery in a house intended to set a bell or bells ringing should a burglar attempt to gain entrance.

**ALARM-CLOCK.** One which can be set so as to ring loudly at a certain hour to wake from sleep or excite attention.

**ALA SHAN.** District in Asia. It is in Mongolia and is part of the great Gobi desert. On its eastern border is the great mountain range called also Ala Shan. This is 150 miles long, and its highest point is over 11,000 feet high.

**ALA-SHEHR** (ä-lä-shār') **(ancient PHILADELPHIA).** A town in Turkey, 105 miles east of Smyrna by rail, famous as the seat of one of the first Christian churches, and still having a vast number of interesting remains of antiquity, consisting of fragments of beautiful columns, sarcophagi, fountains, etc. It is a place of some importance, carrying on a thriving trade, chiefly with Smyrna, to which runs a railway. Pop. 33,000.

**ALAS'KA.** A territory belonging to the United States, comprising all that portion of the north-west of North America, which lies west of the 141st meridian of west longitude, together with an irregular strip of coast-land (and the adjacent islands), extending south to lat. 54° 40′ N., and lying between Canada and the Pacific (the boundary being adjusted in 1903); total area, about 586,400 sq. miles. The chief river is the Yukon, a great stream, now navigated in summer for most of its course. The principal mountains (among which are several volcanoes) are Mounts M'Kinley (20,300 feet) and Wrangell (17,500 feet).

**Climate.** In the interior it is very severe in winter, but in summer the heat is intense; on the Pacific coast it is mild but moist.

**Products.** Alaska produces excellent timber. Numbers of fur-bearing animals abound, such as the fur-seal, sea-otter, beaver, fox, mink, marten, etc.; and the fur trade has long been valuable. The coasts and rivers swarm with fish, and salmon and cod are caught and exported. Gold is now mined in several localities, especially Cape Nome, where a town has sprung up.

The aboriginal inhabitants consist of Esquimaux and Indians.

**History.** Alaska, called Russian America until 1867, was sold to the United States for 7,200,000 dollars, the acquisition being ratified by Congress on 20th June, 1867. It has a legislative assembly consisting of eight senators and sixteen representatives, and the legislature meets biennially since 1913. The capital was formerly Sitka, on Baranoff Island, but is now Juneau, on Gastineau Channel. The population is 59,278.—BIBLIOGRAPHY: A. W. Greely, *Handbook of Alaska*; J. Muir *Travels in Alaska.*

**ALASKITE.** An igneous rock consisting of quartz and felspar. *See* GRANITE.

**ALAS'SIO.** A seaport of North Italy, on the Gulf of Genoa, a winter resort of people from England. Pop. 6450.

**ALATAU** (ä-lä-tou'). The name of three considerable mountain ranges of Central Asia, on the Russian and Chinese frontiers.

**ALAU'DA.** A genus of insessorial birds, which includes the larks. *See* LARK.

**A'LAVA.** A hilly province in the north of Spain, one of the three Basque provinces; area, 1176 sq. miles; covered by branches of the Pyrenees, the mountains being clothed with oak, chestnut, and other timber, and the valleys yielding grain, vegetables, and abundance of fruits. There are iron and copper mines, and inexhaustible salt springs. Capital, Vittoria. Pop. 99,426.

**ALB** (from Lat. *albus*, white). A clerical vestment of the Catholic Church worn by priests while officiating in the more solemn functions of divine service. It is a long robe

of white linen reaching to the feet, bound round the waist by a cincture, and fitting more closely to the body than the surplice. It is now little used except during Mass. After the

A, Alb with its Apparel *a*, *b*, and Girdle *c*; B Amisce; C, Stole.

Reformation the *alb* was not used in the Church of England, but since the ritualistic revival in the nineteenth century it has again been introduced into a number of churches.

**ALBA.** The name of several towns in ancient Italy, the most celebrated of which was Alba Longa, a city of Latium, according to tradition built by Ascanius, the son of Æneas, 300 years before the foundation of Rome, at one time the most powerful city of Latium. It ultimately fell under the dominion of Rome, when the town was destroyed, it is said. In later times its site became covered with villas of wealthy Romans.

**ALBA** (anciently **ALBA POMPEIA**). A town of Northern Italy, about 42 miles by rail S.E. of Turin, is the see of a bishop, has a cathedral, bishop's palace, church with fresco paintings by Perugino, etc. Pop. about 9000.

**ALBA, Duke of.** *See* ALVA.

**ALBACETE** (ål-bå-thā'tā). A town in Southern Spain, capital of the province of the same name, 106 miles N.N.W. of Cartagena, with a considerable trade, both direct and transit, and manufactures of knives, daggers, etc. Pop. 41,885.—The province has an area of 5737 sq. miles, and a pop. of 295,932.

**ALBA LONGA.** *See* ALBA.

**ALBAN, St.** The earliest British martyr, flourished in the third century, and was, it is said, converted from Paganism by a confessor whom he had saved from his persecutors. He refused to sacrifice to the gods, and was executed outside the city of Verulamium (St. Albans) in 285 or 305.

**ALBANI** (ål-bä'nē), **Francesco.** A famous Italian painter, born at Bologna in 1578, died in 1660. He studied with Guido Reni under the Flemish painter Calvaert and the Caracci. It is said that his second wife, Doralice Fioraventi, bore him twelve children of such beauty that they served him as models for his paintings. Among the best known of his compositions are *The Sleeping Venus*, *Diana in the Bath*, *Danae Reclining*, *Galatea on the Sea*, *Europa on the Bull*.

**ALBA'NI, Madame.** Maiden name **Marie Louise Emma Cecile Lajeunesse.** Famous singer, was born near Montreal in 1852, was trained at home by her father, and studied also in Paris and Milan. She made her first public appearance in Europe at Messina, in Bellini's *La Sonnambula*, and in 1872 sang in the Royal Italian Opera in London. Since then she has attained the position of one of the world's foremost singers, both in opera and oratorio. In 1878 she was married to Mr. Ernest Gye, the operatic manager. She adopted the professional name of Albani from Albany, in the United States, where as a girl she sang in the Roman Catholic cathedral. In 1911 she published her memoirs under the title of *Forty Years of Song*. She died in 1930.

**ALBA'NIA.** A kingdom on the west of the Balkan Peninsula, stretching along the coast of the Adriatic for about 290 miles. The area is 10,629 sq. miles. The boundary on the east is formed by a range of mountains, and the country is composed of at least nine ridges of hills, of which six are in Lower or Southern Albania (ancient Epirus) and the remainder in Central and Upper or Northern Albania. There are no large rivers, and in summer many of the streams are completely dry. The Drin or

Drino is the largest. The most beautiful lake is that of Ochrida, 20 miles long, 8 broad at the widest part. The Lake of Scutari, in Upper Albania, is the largest.

Among trees Albania has many species of oak, the poplar, hazel, plane, chestnut, cypress, and laurel. The vine flourishes, together with the orange, almond, fig, mulberry, and citron; maize, wheat, and barley are cultivated. Its fauna comprises bears, wolves, and chamois; sheep, goats, horses, asses, and mules are plentiful.

The chief exports are live stock, wool, hides, timber, oil, salt-fish, cheese, and tobacco.

The chief ports are Prevesa, Valona, and Durazzo. The population, about 1,003,068, consists chiefly of Albanians or Arnauts, or, as they call themselves, Skupetars, i.e. inhabitants of the mountains (by the Turks they are called Arnauts, by the Greeks Arbanites, and by the Serbs Arbanasi). They are spread along the coasts of the Adriatic and Ionian Seas.

**History.** There is little or no record of the arrival of the Albanian race in the Balkan Peninsula. It may, however, be safely asserted that the Albanians are the direct descendants of the earliest Aryan immigrants, who were represented in historical times by the kindred Illyrians, Macedonians, and Epirots. The majority live in Albania, the rest in Montenegro, Greece, Southern Italy, Sicily, Bessarabia, and Asia Minor. As regards religion they are either Christians or Mohammedans. They are divided into several tribes, among whom the Suliotes are partly of Greek origin. The Albanian language is a branch of the Indo-European languages, and related to the long-ago extinct language of the Messapians. The language consists of numerous dialects, which may be divided into those of the Tosks in the south and the Gheggas in the north. Though their country became a province of the Turkish dominions in 1431, they maintained for centuries a certain degree of independence, which the Porte never found it possible to overcome.

Finally, in 1913, after the Balkan War, Albanian autonomy was guaranteed at the Ambassadorial Conference in London, and a German prince (William of Wied) became ruler in 1914. He, however, left the country when the European War broke out. In 1916 the Austrians overran Albania, and in 1917 an Italian general proclaimed its independence. This was recognised by the Powers, and in 1920 Albania became a member of the League of Nations, and was placed under a Council of Regents. In 1925 insurgents attacked and routed the Government forces, capturing Scutari and causing a temporary return to a state of anarchy. At the end of the year, however, Albania became a republic with a parliament of two houses, but in Sept., 1928, it became, with popular acclamation, a constitutional monarchy. Ahmed Beg Zogu, president of the republic, was declared king, and the succession became hereditary in his house. Tirana is the capital.—BIBLIOGRAPHY: H. F. Tozer, *Researches in the Highlands of Turkey*; W. Peacock, *Albania, The Foundling State*.

**ALBA'NO.** A city and lake in Italy, the former 12 miles south-east of Rome, and on the west border of the lake, amid beautiful scenery. An ancient tomb in the Etruscan style was for a long time looked upon as the sepulchre of the Horatii and Curiatii. Here are also the ruins of the villas of Pompey and Domitian. Pop. 8000.

The lake, situated immediately beneath the Alban Hill, is of an oval form, 6 miles in circumference, surrounded by steep banks of volcanic tufa 300 or 400 feet high, and discharges its superfluous waters by an artificial tunnel at least 2000 years old.

**ALBANS, St.** *See* ST. ALBANS.

**AL'BANY.** The original Celtic name probably at first applied to the whole of Britain, but afterwards restricted to the Highlands of Scotland. It gave the title of duke formerly to a prince of the blood-royal of Scotland. The first duke was Robert Stuart (1345-1420), son of Robert II. by his mistress Elizabeth Mure, and brother of Robert III. He was virtual ruler of the kingdom during the latter years of his brother's reign, and acted as regent for his nephew James I. (kept a prisoner in England) till his own death. Another nephew, David, Duke of Rothesay, is said to have been starved to death in Falkland Castle at his instigation. His son Murdoch, second duke, succeeded him as regent, and was put to death by James for maladministration. The third duke was Alexander, second son of James II. and brother of James III. A large part of his life was passed in France. His son John was the fourth who bore the title. He was regent of Scotland during the minority of James V. (1515-23).

**ALBANY.** Town and pleasure resort in Western Australia, Albany is on the south coast, on Princess Royal

Harbour, King George Sound. It is 350 miles from Perth, with which it is connected by railway, and mail boats call here. Pop. 3980.

**Albany** is also the name of a river in Ontario and a province in S. Africa. The former is about 500 miles long. It rises in Lake S. Joseph and falls into James Bay where Fort Albany has been built. The province is in the south-east of the Cape Province. Here, in 1820, the first large body of British settlers made their homes. Grahamstown is the capital.

**AL'BANY.** A city of the United States, capital of the State of New York on the west bank of the Hudson, 145 miles north of New York city, from and to which steamboats run daily. The Erie Canal and the numerous railway lines centring here from all directions greatly contribute to the growth and prosperity of the city, which carries on an extensive trade. It is a great mart for timber, and has foundries, breweries, tanneries, etc.

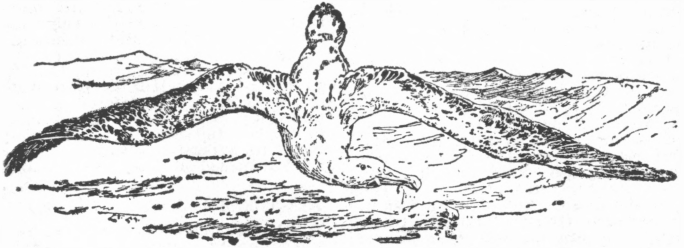
Albany was settled by the Dutch between 1610 and 1614, and the older houses are in the Dutch style, with the gable-ends to the streets.

There is a university, an observatory, and a State library with 90,000 volumes. The principal public buildings are the capitol or State-house, which cost about £5,000,000, and the State-hall for the public offices, a State arsenal, and numerous churches. Pop. 127,412.

**AL'BANY, Louisa Maria Caroline, Countess of.** A princess of the Stolberg-Gedern family, was born in 1753, and married, in 1772, the pretender, Charles Edward Stuart, after which event she bore the above title. To escape from the ill-treatment of her husband she retired, in 1780, to the house of her brother-in-law at Rome, where she met the poet Alfieri, whose mistress she became. After the death of Alfieri in 1803 she opened her famous political and literary salon frequented by the Duchess of Devonshire, the Duchess of Hamilton, Cardinal Consalvi, Samuel Rogers, Thomas Moore, Lamartine, and Chateaubriand. She died at Florence in 1824, where she was buried at the Church of Sta Croce, by the side of Alfieri, whom she is supposed to have married secretly.

**ALBA'TA.** A name sometimes given to German silver.

**AL'BATROSS.** A large marine swimming bird of several species, of which the wandering albatross (*Diomēdea exŭlans*) is the best known. The bill is straight and strong, the upper mandible hooked at the point and the lower one truncated; there are three webbed toes on each foot. The upper part of the body is of a greyish brown, and the belly white. It is the largest sea-bird known, some measuring 17½ feet from tip to tip of their expanded wings. They abound at the Cape of Good Hope and in other parts of the southern seas, and in Behring's Straits, and have been known to accompany ships for whole days without ever resting on the waves. From this habit the bird is regarded with feelings of attachment and superstitious awe by sailors, it being reckoned unlucky to kill one. Coleridge has availed himself of this feeling in his *Ancient Mariner*.



Wandering Albatross (*Diomēdea exŭlans*)

The albatross is met with at great distances from the land, settling down on the waves at night to sleep. It is exceedingly voracious, whenever food is abundant, gorging to such a degree as to be unable to fly or swim. It feeds on fish, carrion, fish-spawn, oceanic mollusca, and other small marine animals. Its cry is harsh and disagreeable. Its nest is a heap of earth; its eggs are larger than those of a goose.

**ALBATROSS.** A name applied to a certain type of German aeroplanes, much used for scouting purposes during the European War.

**ALBAY** (ăl-bī'). A province, town,

bay, and volcano in the south-east part of the Island of Luzon, one of the Philippines. The province is mountainous but fertile; the town regularly built, with a pop. of 33,000; the bay capacious, secure, and almost landlocked; and the volcano, which is always in activity, forms a conspicuous landmark.

**ALBEMARLE, Duke of.** *See* MONK, GEORGE.

**AL'BENDORF.** A village in Prussia, province of Silesia, 50 miles S.W. of Breslau, remarkable for the pilgrimages made to its church, chapels, statues, etc. Pop. 1800.

**ALBERT, Prince, Albert Francis Augustus Charles Emmanuel.** Prince of Saxe-Coburg-Gotha, and Prince Consort of England, second son of Ernest I., Duke of Saxe-Coburg, was born at the Rosenau, a castle near Coburg, on 26th Aug., 1819. In 1837 he entered the University of Bonn, where he devoted himself to the studies of political and natural science, history, philosophy, etc., as well as to those of music and painting. On leaving the university he made a tour through the chief cities of Italy with Baron Stockmar. On 10th Feb., 1840, he married his cousin, Queen Victoria of England. Leopold I., King of the Belgians and uncle of Queen Victoria, was greatly instrumental in bringing about the marriage. An allowance of £30,000 a year was settled upon the prince, who was naturalized by Act of Parliament, received the title of Royal Highness by patent, was made a field-marshal, a Knight of the Garter, of the Bath, etc. Other honours were subsequently bestowed upon him, the chief of which was the title of Prince Consort (1857).

His foreign birth at first caused him to be regarded with some suspicion, but his unfailing tact and genuine ability were not long in gaining their due recognition. He always carefully abstained from party politics, but his knowledge of the politics of his adopted country, both domestic and foreign, was profound and accurate, and must often have been of service to the queen and her advisers. He always took a deep and active interest in the welfare of the people in general. His services to the cause of science and art were very important; he presided over the commission appointed in 1841 to consider the best means of rebuilding the Houses of Parliament, and the great exhibition of 1851 owed much of its success to his activity, knowledge and judgment. The amendment of the Articles of War in 1844 which ultimately put an end to duelling was due to his suggestion.

Cambridge University conferred upon him the degree of LL.D., and in 1847 he was elected Chancellor. He presided and delivered the inaugural address at the meeting of the British Association at Aberdeen in 1859. He died of typhoid fever on 14th Dec., 1861, after a short illness. A collection of his speeches and addresses was published in 1862. A biography of the prince by Sir Theodore Martin was published in 5 volumes. London, 1875-80.

**ALBERT.** First Duke of Prussia, and last grand-master of the Teutonic Order, was born in 1490; died in 1568. In 1511 he was chosen by the Teutonic knights grand-master of their order. Being nephew of Sigismund, King of Poland, the knights hoped by his means to be freed from the feudal superiority of Poland, and placed under the protection of the empire. This superiority, however, Sigismund refused to surrender, and war broke out between uncle and nephew. He subsequently became reconciled to his uncle, and obtained his investiture as hereditary Duke of Prussia under the Polish Crown, the territorial rights of the Teutonic Order being thus set aside. The latter years of his reign were spent in organising the government and promoting the prosperity of his duchy; he founded schools and churches, established a ducal library, and opened the University of Königsberg in 1543.

**ALBERT.** Town of France. It was formerly known as Ancre, on which river it stands. It lies about 18 miles from Amiens. The chief building is the church of Notre Dame. On this was a figure of the Virgin and Child, which was damaged early in the Great War and until March, 1918, when it fell, remained in a hanging position, an object of great interest. The town has some manufactures.

There was constant fighting around Albert during the Great War. The Germans often shelled it, but did not capture it until March 27, 1918. It was recovered in the following August. A battle fought between the French and the Germans, Sept. 20-30, 1914, just after the end of the battle of the Aisne, is called the battle of Albert.

**AL'BERT I.** Duke of Austria, and afterwards Emperor of Germany, son of Rudolph of Hapsburg, was born in 1248. On the death of his father in 1292 he claimed the Empire, but his arrogant conduct drove the electors to choose Adolphus of Nassau emperor. Adolphus, after a reign of

six years, having lost the regard of all the princes of the Empire, Albert was elected to succeed him. A battle ensued near Göllheim, in which Adolph us was slain by his adversary, who was elected and crowned. Pope Boniface VIII., however, refused to acknowledge him as emperor, and ordered the electoral princes to renounce their allegiance to him. On the other hand, Albert formed an alliance with Philip le Bel of France, and offered so determined and successful a resistance to the papal authority that Boniface was induced to withdraw his opposition, on condition that Albert would break with his French ally.

During the subsequent years of his reign the Emperor was engaged in unsuccessful wars with Holland, Hungary, Bohemia, and other States. His measures still further to strengthen his authority over the Swiss Forest Cantons of Unterwalden, Schwyz, and Uri drove the inhabitants into open revolt in Jan. 1308. While on his way to crush the Swiss he was assassinated, at Windisch in May, 1308, by his nephew John, Duke of Suabia, called afterwards the Parricide, whose inheritance he had seized upon.

**ALBERT I.** King of the Belgians, born on 8th April, 1875, at Brussels. He is the son of Prince Philippe, Count of Flanders (died 17th Nov., 1905), and of Princess Marie of Hohenzollern (born 17th Nov., 1845). After the death of his cousin, the Duke of Brabant, and of his father in 1905, Prince Albert became heir apparent. In 1906 he became member of the Belgian Senate and in 1907 was appointed by his uncle, Leopold II., Lieutenant-General. On 2nd Oct., 1900, he married Princess Elizabeth, daughter of Duke Charles Theodor of Bavaria; there are three children. He ascended the Belgian throne in Nov., 1909, after the death of his uncle Leopold II. In 1914 his country became involved in war with Germany and was soon overrun. The king moved the seat of government to Le Havre and after four years of warfare had the satisfaction of recovering his land and re-entering his capital in Nov., 1918.

**ALBERT EDWARD,** or simply **EDWARD.** One of the equatorial lakes of Africa, otherwise known as **Muta Nzige.**

**ALBERT HALL.** An amphitheatre in the Italian Renaissance style in Kensington, London, built during 1867-71 for concerts and assemblies. It can seat 10,000 people, and its organ, which has nearly 9000 pipes, is one of the largest in the world.

**ALBERT MEDAL.** A British decoration consisting of an oval badge hanging from a red and white ribbon and instituted in 1866. Before 1877 it was conferred for bravery in saving life at sea, but since that date has been awarded for similar deeds on land. There is also an Albert medal awarded by the Society of Arts for notable deeds in invention and science.

**ALBERT MEMORIAL.** The monument erected in Kensington Gardens, London, in memory of Prince Albert, consort of Queen Victoria. It is the work of Sir Gilbert Scott, and its style is Victorian Gothic.

**ALBERT, Lake.** A lake of Africa, one of the headwaters of the Nile, lying (approximately) between lat. 2° 30′ and 1° 10′ N., and with its north-east extremity in about lon. 28° E.; general direction from north-east to south-west, surface about 2500 feet above sea-level. It is surrounded by precipitous cliffs, and bounded on the west and south-west by great ranges of mountains. It abounds with fish, and its shores are infested with crocodiles and hippopotami. It receives the Victoria Nile from Lake Victoria, and the White Nile issues from its northern extremity.

**ALBERT-BAPAUME.** Along the great trunk road from Albert to Bapaume and on either side of it, fierce fighting took place during the Somme offensive of 1916, marked by the stages La Boiselle, Pozières and Le Sars. When, in Feb., 1917, the Germans began the great retreat, the fortified village of Pys on the left of the road was seized at a rush. On the 26th the village of Warlencourt fell, and two days later Thilley village 1¼ miles from Bapaume, was taken. The British troops, avoiding direct assaults, gradually encircled the town, forcing the Germans to withdraw. It was entered on 17th March.

**ALBERTA.** A province of Canada, established on 1st Sept., 1905, and comprising the former territory of Alberta and the part of the former territory of Athabasca lying west of the meridian 110°, and having the new province of Saskatchewan on the east, British Columbia on the west, the United States on the south, and Mackenzie territory on the north; area, 255,285 sq. miles.

**Physical Features.** A large part of the area on the west is occupied by the Rocky Mountains, which are shared in common with Alberta and British Columbia, and consist mostly of a series of more or less parallel ridges. One or two of the loftier

summits are in the province, others on the boundary. There is much valuable timber in this district. The general slope of the surface is from west to east and north-east. The province is intersected by numerous rivers and streams that have their sources in the Rockies, some of them, such as the Peace River and the Athabasca, sending their waters to the Arctic Ocean, while the others, such as the North and South Saskatchewan and their tributaries, belong to the Hudson Bay basin. In the extreme south are one or two small tributaries of the Missouri. There are a number of lakes, the largest being the Lesser Slave Lake and Lake Athabasca (partly in this province).

**Products.** Notwithstanding the number of the streams, there are districts, especially in the south, where agriculture cannot be successfully carried on without irrigation. Farther to the north there are areas highly suitable for agriculture, and timber is also abundant. Cattle ranching is successfully carried on in the south, but tillage, with and even without irrigation, is also carried on, fine crops of wheat being grown. The most valuable mineral is coal, which is found at various places, but is chiefly mined in the south at Lethbridge, and farther north in the Banff district. Here there are hot springs and grand scenery, and a large tract of land has been set apart as a national park. Near Edmonton, the capital, coal is found on the bank of the North Saskatchewan, and is readily worked. Iron, petroleum, and other minerals are found.

**Climate.** It is very warm in summer, and in winter less severe and prolonged than might be supposed. The warm *chinook* winds from the Pacific often blow in winter, and speedily melt the snow.

**Railways.** The province is crossed in the south by the Canadian Pacific Railway, running by way of Calgary and Banff, and crossing the Rockies. From Calgary one branch runs north to Edmonton, another runs south to M'Leod, where other lines make a connection with the States railroads and British Columbia. Edmonton, being on the transcontinental main lines of the C.N.R. and C.P.R., has become a great centre of trade and provincial development. It and Calgary are the chief towns. The population in 1911 was returned at 374,663; in 1931 it was 731,605.

**ALBERTITE.** An asphaltic hydrocarbon compound, a soft black material, obtained in Canada.

**ALBER'TUS MAGNUS,** or **ALBERT THE GREAT.** Count of Bollstädt, a distinguished German scholar of the thirteenth century, born in 1193, or 1205, studied at Padua, became a monk of the Dominican order, teaching in the schools of Hildesheim, Ratisbon, and Cologne, where Thomas Aquinas became his pupil. In 1245 he went to Paris and publicly expounded the doctrines of Aristotle, notwithstanding the prohibition of the Church. He is called Doctor Universalis, for he was one of the most proficient scholars of his day, second only to Roger Bacon in his knowledge of nature.

He became rector of the school of Cologne in 1249; in 1254 he was made provincial of his order in Germany; and in 1260 he received from Pope Alexander IV. the appointment of Bishop of Ratisbon. In 1263 he retired to his convent at Cologne, where he composed many works, especially commentaries on Aristotle. He died in 1280. Owing to his profound knowledge he did not escape the imputation of using magical arts and trafficking with the Evil One.

**ALBERTVILLE.** Town of the Belgian Congo. It stands on the western side of Lake Tanganyika and has a railway station. It is an important point on some of the African trade routes.

**AL'BI.** *See* ALBY.

**ALBIGENSES** (al-bi-jen'sēz). A neo-Manichæan sect which spread widely in the south of France and elsewhere about the twelfth century, and which differed in doctrine and practice from the Roman Catholic Church, by which they were subjected to severe persecution. They are said to have been so named from Albi, on the banks of the Tarn, a tributary of the Garonne, where, and about Toulouse, Narbonne, etc., they were numerous. They were also known as Catharists (q.v.) and their doctrines were similar to those of several other religous sects such as the Gnostics, Manichæans, and Bogomils.

Among the principal doctrines of the Albigenses was the belief in the existence of two principles, good and evil, the creators of the spiritual and material worlds. Since all matter is under the control of the evil principle, maintained the Albigenses, all flesh is evil. The extinction of bodily life, therefore, the deliverance of the soul from the prison-house of the body, should be the aim of man. Suicide by means of starvation was consequently highly meritorious. It is admitted even by Catholic writers (see CATHOLIC ENCYCLOPÆDIA, vol. i, p. 268) that the

Albigenses were principally anti-sacerdotal and opposed to the Roman Church on account of the scandalous life led by the Catholic clergy.

A crusade was begun against them, and Count Raymond VI. of Toulouse for tolerating them, in 1209, the army of the cross being called together by Pope Innocent III. The war was carried on with a cruelty which reflected deep disgrace upon the Catholic Church. Béziers, the capital of Raymond's nephew Roger, was taken by storm, and 20,000 of the inhabitants, without distinction of creed, were put to the sword.

Simon de Montfort, the military leader of the crusade, was equally severe towards other places in the territory of Raymond and his allies. After the death of Raymond VI., in 1222, his son, Raymond VII., was obliged, notwithstanding his readiness to do penance, to defend his inheritance against the papal legates and Louis VIII. of France. When hundreds of thousands had fallen on both sides, a peace was made in 1229, by which Raymond was obliged to cede Narbonne with other territories to Louis IX., and make his son-in-law, a brother of Louis, his heir. The heretics were now delivered up to the proselytizing zeal of the Dominicans, and to the courts of the Inquisition, by which means it was brought about that the Albigenses disappeared after the middle of the thirteenth century. Cf. C. Schmidt, *Histoire et doctrine de la Secte des Cathares ou Albigeois* (2 vols.).

**ALBINOS** (al-bī'nōz). The name given to those persons from whose skin, hair, and eyes, in consequence of some defect in their organisation, the dark colouring matter is absent. The skin of albinos, therefore, whether they belong to the white, Indian, or negro races, is of a uniform pale milky colour, their hair is white, while the iris of their eyes is pale rose colour, and the pupil intensely red, the absence of the dark pigment allowing the multitude of blood-vessels in these parts of the eye to be seen. For the same reason their eyes are not well suited to endure the bright light of day, and they see best in shade or by moonlight. The peculiarity of *albinism* or *leucopathy* is hereditary and not confined to the human race, having been observed also in horses, rabbits, rats, mice, etc., birds (white crows or blackbirds are not particularly uncommon), and fishes. Albinos are not of necessity lacking in mental vigour or capacity. Cf. Karl Pearson, *A Monograph on Albinism in Man*.

**AL'BION** (Celtic *Albainn*). The earliest name by which the island of Great Britain was known, employed already by writers of the sixth century B.C., who speak not of Britannia but of the land of the Albiones, and in poetry still used for Great Britain. It is connected with Lat. *albus*, white, on account, perhaps, of the chalk cliffs of Dover. The same word as *Albany, Albyn*.

**ALBION METAL.** Combination of tin and lead. It can be employed with great facility in the workshop, and is consequently a valuable material for the production of small ornamental articles, toys and fancy goods, and the cheaper forms of jewellery. The two basic metals are combined under great mechanical pressure, and the product is distinct from the alloy formed by the fusion of tin and lead, which is known as pewter.

**AL'BITE,** or **SODA-FELSPAR.** A mineral, a kind of felspar, usually of a white colour, to which property it owes its name (Lat. *albus*, white), but occasionally bluish, greyish, greenish, or reddish white.

**ALBIZZIA** (al-bit'si-a). A genus of leguminous trees and shrubs, allied to the genus Acacia, with doubly-pinnate leaves and white, yellow, or red flowers often in globular heads, and broad, straight, flat pods. They number over fifty species, and inhabit tropical and subtropical Asia, Africa, and Australia. *A. lophanta*, a native of south-western Australia, has a bark that contains tannin. *A. Lebbek*, a native of Asia and Africa, yields valuable timber, and in Egypt is much cultivated as a shade tree. *A. Julibrissin*, a tree with rose-red flowers, is found in Asia and Africa, and has been introduced into Southern Europe.

**AL'BOIN.** King of the Lombards, succeeded his father Audoin in 561, and reigned in Noricum and Pannonia. Narses, the general of Justinian, sought his alliance, and received his aid, in the war against Totila, King of the Ostrogoths. Alboin afterwards (in 568) undertook the conquest of Italy, where Narses, who had subjected this country to Justinian, offended by an ungrateful Court, sought an avenger in Alboin, and offered him his co-operation. After a victorious career in Italy he was slain at Verona, in 573 or 574, by an assassin, instigated by his wife Rosamond, whose hatred he had incurred by sending her, in one of his fits of intoxication, a cup wrought from the skull of her father, and forcing her to drink from it.

**ALBRECHTSBERGER** (ål'brehts-ber-gĕr), **Johann Georg.** A German composer and writer on music; a teacher of Beethoven, Moscheles, etc. Born 1736, died 1809.

**ALBRET, Jeanne d'** (zhàn dål-brā). Queen of Navarre, wife of Antoine de Bourbon and mother of Henri IV. of France, a zealous supporter of the reformed religion, which she established in her kingdom; born 1528, died (probably poisoned) 1572, shortly before the massacre of St. Bartholomew.

**ALBUERA** (ål-bụ-ā'rà). A village of Spain, in Estremadura, 13 miles S.S.E. of Badajoz. A battle was fought here, 16th May, 1811, between the army of Marshal Beresford (30,000) and that of Marshal Soult (25,000), when the latter was obliged to retreat to Seville, leaving Badajoz to fall into the hands of the allies.

**ALBU'GO.** An affection of the eye, consisting of a white opacity in the cornea; called also **leucoma.**

**AL'BUM.** In ancient Rome a board painted white, on which edicts and public notices were inscribed in black. It is now a name generally given to a blank book for the reception of pieces of poetry, autographs, engravings, photographs, etc. In law it is applied to rent paid in silver (white money).

**ALBU'MEN,** or **ALBUMIN** (Lat., from *albus*, white). A substance, or rather group of substances, so named from the Latin for the white of an egg, which is one of its most abundant known forms. It may be taken as the type of the protein compounds or the nitrogenous class of foodstuffs. One variety enters largely into the composition of the animal fluids and solids, is coagulable by heat at and above 160°, and is composed of carbon, hydrogen, nitrogen, and oxygen, with a little sulphur. It abounds in the serum of the blood, the vitreous and crystalline humours of the eye, the fluid of dropsy, the substance called coagulable lymph, in nutritive matters, the juice of flesh, etc. The blood contains about 7 per cent of albumen.

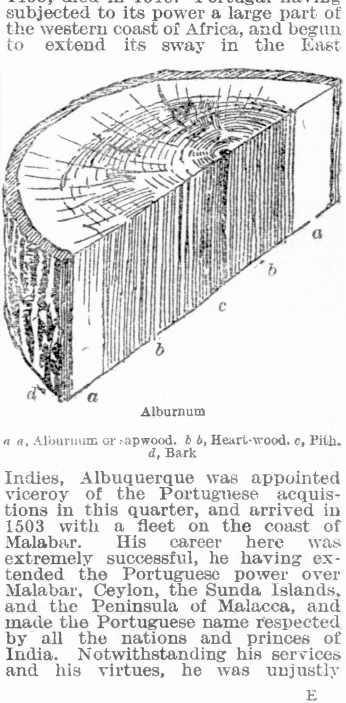
Another variety, called vegetable albumen, exists in most vegetable juices and many seeds, and has nearly the same composition and properties as egg albumen. When albumen coagulates in any fluid it readily encloses any substances that may be suspended in the fluid. Hence it is used to clarify syrupy liquors. In cookery, white of eggs is employed for clarifying, but in large operations, like sugar-refining, the serum of blood is used. From its being coagulable by various salts, and especially by corrosive sublimate, with which it forms an insoluble compound, white of egg is a convenient antidote in cases of poisoning by that substance. With lime it forms a cement to mend broken ware.

In botany the name albumen is given to the farinaceous matter which surrounds the embryo, the term in this case having no reference to chemical composition. It constitutes the meat of the coconut, the flour or meal of cereals, the roasted part of coffee, etc.

**ALBUMINU'RIA.** A condition in which the urine contains albumen, evidencing a diseased state of the kidneys.

**ALBUÑOL** (ål-bụ-nyol'). A seaport of Southern Spain, province Granada, on the Mediterranean. Pop. 9400.

**ALBUQUERQUE** (ål-bụ-kerk'ā), **Affonso d'.** Surnamed "the Great," an eminent Portuguese admiral, born 1453, died in 1515. Portugal having subjected to its power a large part of the western coast of Africa, and begun to extend its sway in the East




Alburnum

*a a*, Alburnum or sapwood. *b b*, Heart-wood. *c*, Pith. *d*, Bark

Indies, Albuquerque was appointed viceroy of the Portuguese acquisitions in this quarter, and arrived in 1503 with a fleet on the coast of Malabar. His career here was extremely successful, he having extended the Portuguese power over Malabar, Ceylon, the Sunda Islands, and the Peninsula of Malacca, and made the Portuguese name respected by all the nations and princes of India. Notwithstanding his services and his virtues, he was unjustly

superseded in his commands by his personal enemy Lopez Soarez, and so severely did he feel the ingratitude of his sovereign, King Emanuel, that he died a few days after receiving the intelligence. His famous letter to the king was discovered and published in 1542 by J. M. de Fonseca. The first volume of his letters was published in 1884 by the Royal Academy of Lisbon.

**ALBUR'NUM.** The soft white substance which, in trees, is found between the liber or inner bark and the wood, and, in progress of time acquiring solidity, becomes itself the wood. A new layer of wood, or rather of alburnum, is added annually to the tree in every part just under the bark.

**ALBURY** (al'ber-i). A rising town of New South Wales on the borders of Victoria, on the right bank of the Murray, 190 miles north-east of Melbourne, in a good agricultural and wine-producing district. Pop. 9320.

**ALBY,** or **ALBI** (âl'bē). An old town of southern France, department of Tarn, 48 miles north-east of Toulouse, on the Tarn, in an extensive plain. It has a cathedral, a Gothic structure, begun in 1282. It manufactures linens, cottons, leather, etc. Alby is said to have given the Albigenses their name. Pop. 29,351.

**ALBURY.** A village of Surrey, 30¾ miles from London, can be reached from Chilworth, on the Southern Rly. There is an old church and the one built by the banker, Henry Drummond, for the Catholic Apostolic faith. The former is used as a mortuary chapel. Drummond lived at Albury Park, now a seat of the Duke of Northumberland. Near is the Silent Pool (Sherbourne Pond).

**ALÆC'US.** One of the greatest Grecian lyric poets, was born at Mitylene, in Lesbos, and flourished there at the close of the seventh and beginning of the sixth centuries B.C.; but of his life little is known. A strong manly enthusiasm for freedom and justice pervades his lyrics, of which only a few fragments are left. He wrote in the Æolic dialect, and was the inventor of a metre that bears his name (Alcaics), which Horace has employed in many of his odes.

**ALCALA' DE GUADAIRA** (gwâ-dī'râ; "the castle of Guadaira"). A town of southern Spain, on the Guadaira, 7 miles east of Seville, chiefly celebrated for its manufacture of bread, with which it supplies a large part of the population of Seville. Pop. 11,038.

**ALCALA' DE HENARES** (en-ä'res). A beautiful city of Spain, 16 miles E.N.E. of Madrid, 1 mile from the Henares. It has an imposing appearance when seen from some distance, but on nearer inspection is found to be in a state of decay. There was formerly a university here, at one time attended by 10,000 students; but in 1836 it was removed with its library to Madrid. Cervantes was born here. Pop. 11,728.

**ALCALA' LA REAL** (râ-âl'). A town of Spain, 18 miles south-east of Jaen, with a fine abbey and some trade. It was captured in 1340 by Alphonso XI. of Leon, from whence it derives the epithet Real ("Royal"). Pop. 16,250.

**ALCALDE** (Sp.; âl-kâl-dā), or **ALCAIDE** (Port.; al-kī'dā; Ar. *alqadi* (Cadi), the judge, not to be confused with *alcaide*, the governor of a fortress). The name of a magistrate in the Spanish and Portuguese towns, to whom the administration of justice and the regulation of the police is committed. His office nearly corresponds to that of justice of the peace. The name and the office are of Moorish origin.

**AL'CAMO.** A city in the west of Sicily, 2½ miles south of the Gulf of Castellamare, near the site of the ancient Segesta, the ruins of which, including a well-preserved Doric temple and a theatre, as well as the remains of Moorish occupation, are still to be found here. The district is celebrated for its wine. Pop. 63,000.

**ALCAÑIZ** (âl-kân-yēth'). A town of north-eastern Spain (Aragon). Pop. 8750.

**ALCAN'TARA** (Ar., "the bridge"). An ancient town and frontier fortress of Spain, on the Tagus, on a rocky acclivity, and enclosed by ancient walls. Pop. 3224.—**Order of Alcantara,** an ancient Spanish order of knighthood instituted for defence against the Moors in 1156, and made a military religious order in 1197.

**ALCARRAZA** (âl-kâr-râ'thâ). A vessel made of a kind of porous, unglazed pottery, used in Spain to hold drinking-water, which, oozing slightly through the vessel, is kept cool by the evaporation that takes place at the surface. Similar vessels have been long used in Egypt and elsewhere.

**ALCAZAR DE SAN JUAN** (âl-kä'thâr dā sân *hwän*). A town of Spain, province of Ciudad-Real (New Castile), with manufactures of soap, saltpetre, gunpowder, chocolate, etc. Pop. 16,009.

**ALCE'DO.** *See* KINGFISHER.

**ALCESTER.** Market town of Warwickshire, 16 miles from Warwick and 97¼ from London, on the G.W.Rly. The church is worth a visit and there is an old town hall. Here the little rivers Alne and Arrow unite. The town has a golf course and near is a Roman camp. Pop. 2259.

The title of **Baron Alcester** was taken by Sir Frederick Beauchamp Paget Seymour when, in 1882, he was made a peer. He was commander of the fleet that bombarded Alexandria in that year. He died March 30, 1895, leaving no heir.

**ALCES'TIS.** In Greek mythology, wife of Admetus, King of Thessaly. Her husband was ill, and, according to an oracle, would die unless someone made a vow to meet death in his stead. This was secretly done by Alcestis, and Admetus recovered. After her decease Hercules brought her back from the infernal regions.

**AL'CHEMY,** or **ALCHYMY.** The art which in former times occupied the place of and paved the way for the modern science of chemistry (as astrology did for astronomy), but whose aims were not scientific, being confined solely to the discovery of the means of indefinitely prolonging human life, and of transmuting the baser metals into gold and silver. Among the alchemists it was generally thought necessary to find a substance which, containing the original principle of all matter, should possess the power of dissolving all substances into their elements. This general solvent, or *menstruum universale*, which at the same time was to possess the power of removing all the seeds of disease out of the human body and renewing life, was called the *philosophers' stone*, *lapis philosophorum*, and its pretended possessors were known as *adepts*.

Alchemy flourished chiefly in the Middle Ages, though how old such notions might be as those by which the alchemists were inspired it is difficult to say.

There are many stories about the mystic origin of alchemy. The art is said to have been taught by the fallen angels, by Isis, or by Miriam, sister of Moses, or by John the Baptist. According to Suidas, Egypt was the home of alchemy, and the mythical Hermes Trismegistus of pre-Christian times was said to have left behind him many books of magical and alchemical learning, and after him alchemy received the name of the *hermetic art*.

At a later period chemistry and alchemy were cultivated among the Arabians, and by them the pursuit was introduced into Europe. Many of the monks devoted themselves to alchemy, although they were afterwards prohibited from studying it by the popes. Thus Albertus Magnus is said to have been the author of a work *De Alchimia*, and several treatises on the subject are attributed to Thomas Aquinas. But even Pope John XXII. is said to have worked at the science at Avignon. Raymond Lully, or Lullius, a famous alchemist of the thirteenth and fourteenth centuries, is said to have changed for King Edward I. a mass of 50,000 lb. of quicksilver into gold, of which the first rose-nobles were coined. Among other alchemists may be mentioned John Cremer, Abbot of Westminster (1327-77), Nicholas Flamel (1330-80), Basilius Valentinus, Isaac of Holland, and Paracelsus (1493-1541).

With the growth of chemistry, the recognition of the chemical elements as forming a large number of distinct substances, and the conception of the fixed unalterable nature of the atoms, attempts to transform the base metals into gold were largely abandoned as being unscientific. But the most modern view of matter, namely, that the atoms of all elements are composed of numerous electrons, favours the idea of the transmutability of elements, and the production of helium from radium (*see* these articles) by Ramsay shows the possibility of this transmutation.

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**ALCIBI'ADES** (-dēz). A famous Athenian statesman and general of high family and of great abilities, but of no principle, was born at Athens in the 82nd Olympiad, 450 B.C., being the son of Cleinias, and a relative of Pericles, who also was his guardian. In youth he was remarkable for the beauty of his person, no less than for the dissoluteness of his manners. He came under the influence of Socrates, but little permanent effect was produced on his character by the precepts of the sage. He acquired great popularity by his liberality in providing for the amusements of the people, and after the death of Cleon attained a political ascendancy which left him no rival but Nicias. Thus he played an important part in the long-continued Peloponnesian war.

In 415 he advocated the expedition against Sicily, and was chosen one of the leaders, but before the

expedition sailed he was charged with profaning and divulging the Eleusinian mysteries, and mutilating the busts of Hermes, which were set up in public all through Athens. Rather than stand his trial he went over to Sparta, divulged the plans of the Athenians, and assisted the Spartans to defeat them. Sentence of death and confiscation was pronounced against him at Athens, and he was cursed by the ministers of religion.

He soon left Sparta and took refuge with the Persian satrap Tissaphernes, ingratiating himself by his affectation of Persian manners, as he had previously done at Sparta by a similar affectation of Spartan simplicity. He now began to intrigue for his return to Athens, offering to bring Tissaphernes over to the Athenian alliance, and after a while he was recalled and his banishment cancelled. He, however, remained abroad for some years in command of the Athenian forces, gained several victories, and took Chalcedon and Byzantium. In 407 B.C. he returned to Athens, but in 406, the fleet which he commanded having suffered a severe defeat, he was deprived of his command. He once more went over to the Persians, taking refuge with the satrap Pharnabazus of Phrygia, and here he was assassinated in 404 B.C. The authorities for his life are Thucydides, Xenophon, Plutarch, and Cornelius Nepos.

**ALCINOUS** (al-sin'o-us). King of the Phæacians. *See* ULYSSES.

**ALCIRA** (ål-thē'rå). A town of Spain, province of Valencia, on the Jucar, founded by the Carthaginians. Fruits, rice, etc., are grown. Pop. 22,657.

**ALC'MAN.** The chief lyric poet of Sparta, a Lydian by birth, flourished between 671 B.C. and 631, and wrote (in the Doric dialect) love songs, hymns, pæans, etc., of which only fragments remain.

**ALCME'NA.** *See* AMPHITRYON.

**ALCO.** A small variety of dog, with a small head and large pendulous ears, found wild in Mexico and Peru, and also domesticated.

**ALCOBAÇA** (ål-kō-bā'sȧ). A small town of Portugal, 50 miles north of Lisbon, celebrated for a magnificent Cistercian monastery founded in 1148 by Don Alphonso I., and completed in 1222. It contains the tombs of Alphonso II., Alphonso III., Pedro I. and his wife, Ines de Castro.

**AL'COHOL,** or **ETHYL ALCOHOL,** $C_2H_6O$. Is a substance obtained by allowing the juice of the grape to undergo a change known as fermentation. It is only in modern times that alcohol has been isolated and its properties examined. Alcohol is now prepared in enormous quantities, both for industrial purposes and for the preparation of alcoholic beverages, from substances rich in sugar or in starch.

Potatoes and maize form the main source of alcohol. These are treated with steam under pressure in specially-constructed tanks to extract starchy materials. The starch so liberated is then fermented by means of a substance diastase. This treatment transforms sugar into alcohol and carbonic acid gas. The solution is then filtered to remove all insoluble matter, proteids, etc., and from this solid residue, cattle feeding cakes are made. This treatment yields a solution containing 9-10 per cent alcohol. The solution is fractionally distilled, using a special form of distilling column. The most volatile part of the distillate, first runnings, contains acetaldehyde, the second fraction contains the bulk of the alcohol and some water, and the least volatile portion, last runnings, fusel oil and higher alcohols. By this means a liquid containing 80-95 per cent alcohol, rectified spirits, is obtained. For preparation of beverages, fusel oil must be carefully separated from alcohol, as fusel oil has an injurious effect physiologically. The removal of the last traces of water from alcohol is very troublesome. It is repeatedly distilled over quicklime or freshly-ignited potassium carbonate, giving an alcohol containing 98-99 per cent alcohol. The small quantity of water still contained is removed by leaving it in contact with metallic calcium. An alcohol containing more than 96 per cent alcohol is known as *absolute*.

Pure alcohol is a colourless poisonous liquid boiling at 78° C., possessing a strong odour and a burning taste. It is inflammable and mixes with water in all proportions and has a specific gravity 0.80625 at 0° C. Very low temperatures convert it into a glassy solid, melting at − 117° C., hence it may be used in thermometers for low-temperature measurements. Alcohol burns with a non-luminous flame and gives out great heat; it is used, therefore, in various types of lamps for heating purposes. It is also used as a fuel for motors and is a very valuable solvent for many substances such as resin, oils, colouring-matter, varnishes, and ethereal essences. The so-called "solid alcohol" can be obtained by dissolving 30 to 40 parts of collodion in 100 parts of alcohol, a solid which

separates and burns like alcohol, leaving no residue.

Alcohol is the important constituent of all alcoholic beverages and it is due to its presence that wine, whisky, etc., have a stimulating and intoxicating effect on the nervous system. Beverages such as beer, wine, cider, etc., are prepared by direct fermentation of sugars obtained in fruit juices in the case of wine and cider and from barley in the case of beer. These contain varying amounts of alcohol, thus wine may contain from 8 to 10 per cent of alcohol, whilst beer contains 3 to 5 per cent. Whisky, brandy, etc., contain more alcohol, 50-70 per cent, and for the preparation of these the alcohol used must be distilled and purified after fermentation.

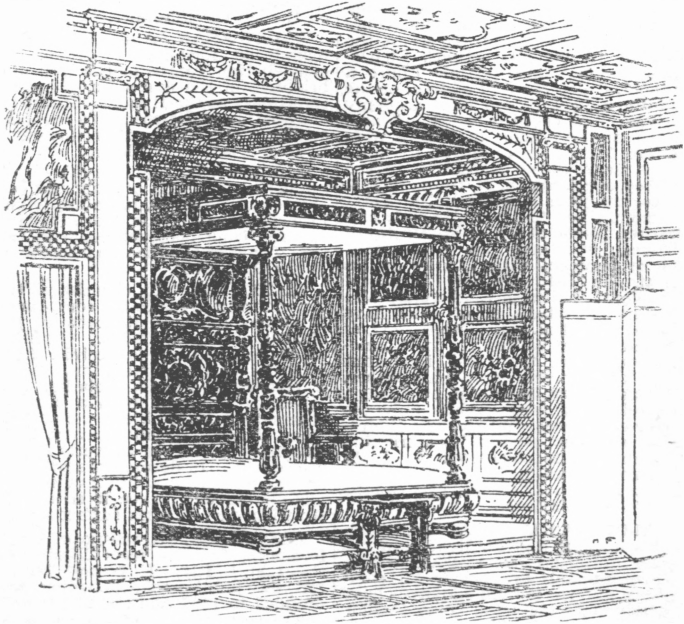
The alcohol content of an aqueous solution may be deduced from a determination of the specific gravity of the solution or directly by the Alcoholometer. This gives percentage by volume. The amount of alcohol present in any alcoholic beverage cannot be obtained directly, but if $\frac{1}{3}$ of the liquid be distilled and the distillate made up to the original volume, then the alcohol may be determined by the Alcoholometer. The name alcohol is applied generally in chemistry to a large group of substances, containing carbon, hydrogen, and oxygen, which have chemical properties analogous to those of ethyl alcohol.

**AL'COHOLISM.** A morbid condition of the body (especially of the nervous system) brought on by the immoderate use of alcoholic liquors.

**ALCOHOLOM'ETER.** An instrument, constructed on the principle of the hydrometer, to determine from the specific gravity of spirituous liquors the percentage of alcohol they contain, the scale marking directly the required proportion. If the liquor contains anything besides water and alcohol, previous distillation is necessary.

**ALCO'RAN.** *See* KORAN.

**AL'COTT, Louisa May.** A distinguished American authoress, born in 1833. She wrote a number of books chiefly intended for the young : *Little Women* (1867), *An Old-fashioned Girl* (1869), *Little Men*



Alcove. French : late sixteenth century

(1871), *Jack and Jill* (1880), etc. Died in 1888.

**AL'COVE.** A recess in a room, usually separated from the rest of the room by columns, a balustrade, or by curtains, and often containing a bed or seats.

**ALCOY'.** A town of Spain, in Valencia, 24 miles north by west of Alicante, in a richly-cultivated district. There is a Roman bridge over the river, and the town has a very picturesque appearance; its chief manufactures are paper and woollen goods. On the 22nd of April an annual feast is celebrated by the inhabitants of the town commemorating a victory over the Moors in 1257. Pop. 36,463.

**ALCUDIA, Duke of.** *See* GODOY.

**ALCUIN** (alk'win; in his native tongue *Ealhwine*). A learned Englishman, the confidant, instructor, and adviser of Charles the Great (Charlemagne). He was born at York in 735, and was educated at York School, of which he subsequently was head master. Alcuin having gone to Rome, Charlemagne became acquainted with him at Parma, invited him in 782 to his Court, and made use of his services in his endeavours to civilize his subjects. To secure the benefit of his instructions, Charlemagne established at his Court a school, called *Schola Palatina*, or the Palace School. In the royal academy Alcuin was called *Flaccus Albinus*. Most of the schools in France were either founded or improved by him; thus he founded the school in the abbey of St. Martin of Tours, in 796, after the plan of the school in York.

Alcuin left the Court in 801, and retired to the abbey of St. Martin of Tours, but kept up a constant correspondence with Charles to his death in 804. He left works on theology, philosophy, rhetoric, also poems and letters, all of which have been published. His letters, 232 of which were addressed to Charlemagne, form the most important part of his work. As a philosopher, Alcuin, though lacking in originality, exercised a considerable influence over his contemporaries. The expression of "scholasticism" is attributed to him.—BIBLIOGRAPHY: C. J. B. Gaskoin, *Alcuin, His Life and his Work*; J. B. Mullinger, *The Schools of Charles the Great*.

**ALCYONA'RIA.** Cœlenterate animals forming a great division of the class Actinozoa (*see* SEA-ANEMONE). These animals are nearly all composite, and the individual polyps have mostly eight tentacles. They include the organ-pipe corals, sea-pens, fan-corals, etc., as also the red coral of commerce. The polyps resemble those of the genus Alcyonium in structure, and in the number and arrangement of the tentacles. *See* ALCYONIUM.

**ALCYONE.** The daughter of Æolas, god of the winds in Greek legend. Zeus changed her and her husband into seabirds. She hovered over the sea for seven days in winter, and her father prevented the wind from blowing, so the days during that time were called halcyon or peaceful days.

**ALCYO'NIUM.** A genus of cœlenterate animals, one familiar species of which, dredged around the British coasts—*A. digitātum*—is named "Dead-Men's Fingers," or "Cow's Paps," from its lobed or digitate appearance. It grows attached to stones, shells, and other objects. It consists of a mass of little polyps, each polyp possessing eight little fringed tentacles disposed around a central mouth. The Alcyonium forms the type of the *Alcyonaria*.

**AL'DAN.** A river of Eastern Siberia, a tributary of the Lena, 1200 miles in length. The Aldan Mountains run along parallel to it on the left for 400 miles.

**ALDEB'ARAN.** A star of the first magnitude, forming the eye of the constellation Taurus or the Bull, the brightest of the five stars known to the Greeks as the Hyades. Spectrum analysis has shown it to contain antimony, bismuth, iron, mercury, hydrogen, sodium, calcium, etc.

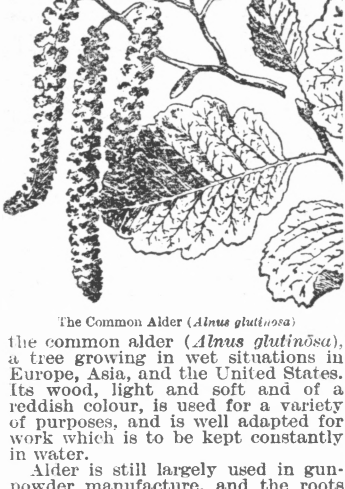
**ALDEBURGH** (ąld'bu-ru). A municipal borough of England, on the coast of Suffolk, more important formerly than it is now, having suffered from encroachments of the sea. The poet Crabbe was born there. Pop. (1931), 2480.

**AL'DEHYDE.** In chemistry, the generic name given to the compounds of alcohol intermediate between the alcohols and the acids. Common aldehyde ($C_2H_4O$) is derived from spirit of wine by oxidation, and is a colourless, limpid, volatile, and inflammable liquid, with a peculiar ethereal odour, which is suffocating when strong; specific gravity, 0.79. Atmospheric oxygen converts it into acetic acid. It decomposes oxide of silver, depositing a brilliant film of metallic silver; hence it is used in silvering curved glass surfaces.

**ALDENHAM.** A village of Hertfordshire, 3 miles from Elstree on the L.M.S. Rly. It is best known for its public school, which was founded in 1597 and has 250 boys.

**ALDER** (ąl'dĕr; Alnus). A genus

of plants of the sub. ord. Betulaceæ (Birch), (nat. ord. Amentaceæ). Fourteen species are known as small trees or shrubs indigenous to temperate and colder regions of the globe; eight of these are found in Central and Western Europe. The only species indigenous to Britain is



The Common Alder (*Alnus glutinosa*)

the common alder (*Alnus glutinōsa*), a tree growing in wet situations in Europe, Asia, and the United States. Its wood, light and soft and of a reddish colour, is used for a variety of purposes, and is well adapted for work which is to be kept constantly in water.

Alder is still largely used in gunpowder manufacture, and the roots and knots furnish a beautifully-veined wood well suited for cabinet work; it is used for cigar-boxes in East Prussia and West Russia. The bark is used in tanning and leather-dressing, and by fishermen for staining their nets. This and the young twigs are sometimes employed in dyeing, and yield different shades of yellow and red. With the addition of copperas it yields a black dye.

**ALDERLEY EDGE.** A town of England, Cheshire, about 8 miles south-west of Stockport. Pop. (1931), 3141.

**AL'DERMAN** (al'dêr-; Anglo-Saxon *caldorman*, from *caldor*, older, and *man*). Among the Anglo-Saxons a person of a rank equivalent to that of an earl or count, the governor of a shire or county, and member of the *witena-gemót* or great council of the nation. Aldermen played an important rôle already before the Constitution of Egbert, but reached their highest power during the reign of Alfred the Great, who had married the daughter of an alderman. Aldermen, at present, are officers associated with the mayor of a city for the administration of the municipal government in England and the United States.

**AL'DERNEY** (Fr. *Aurigny*). An island belonging to Britain, off the coast of Normandy, 10 miles due west of Cape La Hogue, and 60 from the nearest point of England, the most northerly of the Channel Islands, between 3 and 4 miles long, and about 1¼ broad. The coast is bold and rocky; the interior is fertile. About a third of the island is occupied by grass lands; and the Alderney cows, a small-sized but handsome breed, are famous for the richness of their milk. The climate is mild and healthy. A judge, with six "jurats," chosen by the people for life, and twelve "douzainiers," representatives of the people, form a kind of local legislature. The French language still prevails among the inhabitants, but all understand and many speak English. The Race of Alderney is the strait between the coast of France and this island. Pop. (1931), 1506.

**ALDERSHOT** (äl'dêr-). A town and military station in England, the latter having given rise to the former. The "camp" was originated in 1854 by the purchase by Government of a tract of moorland known as Aldershot Heath, on the confines of Surrey, Hampshire, and Berkshire. The object was to accustom both officers and soldiers to act more readily when drawn up in brigades and divisions, their practice having been limited for the most part, since the termination of the French war, to the movements of battalions and companies.

It was also deemed advisable to accustom the army to camp life, and to exercise the men in all the evolutions and movements which they might be required to perform when brought into actual contact with the enemy. The accommodation provided for the army, officers as well as men, consisted at first of wooden huts; but these have been superseded by brick barracks, and altogether the money expended on the camp has amounted to over £3,000,000. The men are exercised in marching, skirmishing, and similar field operations, which are carried on during the summer months with great activity: they are also instructed in the camp in cooking and other duties. The troops at Aldershot in summer include a number of Territorials, Senior and Junior O.T.C., etc.

The town is in the neighbourhood of the barracks, immediately beyond the Government ground, and in Hampshire. It contains several

churches, and has schools, newspapers, literary institutes, music-halls, etc. Aldershot gives its name to a parliamentary division of Hants. Pop. (1931), 34,281.

**ALD'HELM.** An Anglo-Saxon scholar and prelate, Abbot of Malmesbury and Bishop of Sherborne, born 640 (?), died 709. He was a great fosterer of learning and builder of churches, and has left Latin writings on theo'ogical subjects.

**AL'DINE EDITIONS.** The name given to the works which proceeded from the press of Aldus Manutius and his family at Venice (1494-1592), Rome (1562-70), and Bologna. (*See* MANUTIUS.) Recommended by their value, as well as by a splendid exterior, they have gained the respect of scholars and the attention of book-collectors. Many of them are the first printed editions (*editiones principes*) of Greek and Latin classics. Others are texts of the modern Italian authors. These editions are of importance in the history of printing. The editions printed by Aldus Manutius the Elder are, however, much more valuable than those issued by his descendants. Among the former are the first edition of the works of Aristotle in 5 vols., and the works of Virgil, Horace, and Petrarch. Aldus had nine kinds of Greek type, and no one before him printed so much and so beautifully in this language. Of the Latin character he procured fourteen kinds of type.

**ALDOBRANDI'NI.** The name of a Florentine family, subsequently of princely rank (now extinct), which produced one Pope (Clement VIII.) and several cardinals, archbishops, bishops, and men of learning.—**Aldobrandini Marriage**, one of the most beautiful ancient fresco paintings, belonging probably to the time of Augustus, discovered in 1606 on Mount Aquilinus at the very spot where once were the gardens of Mæcenas, and acquired by Cardinal Aldobrandini, nephew of Clement VIII., now in the Vatican. It represents a marriage scene in which ten persons are portrayed. There is a beautiful copy of this fresco by Poussin in the Galleria Doria at Rome.

**AL'DRED,** or **EALDRED.** Anglo-Saxon prelate, Bishop of Worcester and Archbishop of York, born 1000(?), died 1069. He improved the discipline of the Church and built several monastic churches. On the death of Edward the Confessor he is said to have crowned Harold. Having submitted to the Conqueror, whose esteem he enjoyed and whose power he made subservient to the views of the Church, he also crowned him as well as Matilda.

**ALD'RICH, Henry.** Dean of Christ Church, Oxford; born in 1647, died in 1710; distinguished as a philosopher, an architect, and as a musician. His *Compendium of Logic* was a text-book till long past the middle of last century. He adapted many of the works of the older musicians, such as Palestrina and Carissimi, to the liturgy of the Church of England, and composed many services and anthems, some of which are still heard in English cathedrals.

**ALDRICH, Thomas Bailey.** The most conspicuous American poet of his generation. Born at Portsmouth, New Hampshire, on 11th Nov., 1836; died at Boston in March, 1907. He edited *Every Saturday* in Boston from 1865 to 1874, and the *Atlantic Monthly* from 1881 to 1890. He was a poet of some skill, the chief characteristic of his lyrics being refinement and finish. Some of his short stories have been rarely surpassed by other American writers. Among his volumes of verse are: *The Ballad of Babie Bell* (1856); *Cloth of Gold* (1874); *Lyrics and Sonnets* (1880); *Friar Jerome's Beautiful Book* (1881); *Unguarded Gates and other Poems* (1895), etc. His prose works include: *Story of a Bad Boy* (1870); *Marjorie Daw and other People* (1873); *The Stillwater Tragedy* (1880); *Two Bites of a Cherry* (1893).

**ALDROVAN'DI, Ulysses.** A distinguished Italian naturalist; born 1522, died 1607. He was professor at Bologna, and established botanical gardens and a museum of natural history there; wrote a work on natural history in 14 vols. His *Antidotarii Bononiensis epitome* (1574) has served as a model for all Pharmacopœias published in later years.

**ALDWICK.** Village of Sussex. It is on the coast about a mile to the west of Bognor. Here is Craigweil House, where King George went to recuperate after his illness of 1928-29.

**ALDWYCH** (öld'wich). Street in London. This name is taken from that of a Danish settlement. It is a curve meeting the Strand at both ends, with Kingsway running from it to Holborn. It was opened in 1905. The **Aldwych Club,** at 18 Exeter Street, London, W.C., is for advertising and business men generally. It was founded in 1911.

**ALE** and **BEER.** Well-known and extensively-used fermented liquors, the principle of which is extracted from several sorts of grain but most commonly from barley, after it has

undergone the process termed malting. Beer is a more general term than ale, being often used for any kind of fermented malt liquor, including porter, though it is also used in a more special signification. *See* BREWING.

**ALEARDI** (à-lā-àr'dē), **Aleardo.** A distinguished Italian lyrical and political poet and patriot, born 1812, died 1878: he was a member of the Italian board of higher education and a senator. His best work is his poem, *Il Monte Circello* (1844).

**ALE-CONNER.** Formerly an officer in England appointed to assay ale and beer, and to take care that they were good and wholesome, and sold at a proper price. The duty of the ale-conners of London was to inspect the measures used in public-houses, to prevent frauds in selling liquors. Four of these were chosen annually by the liverymen, in common hall, on Midsummer's Day.

**ALE-COST.** *See* COSTMARY.

**ALECTO.** In Greek mythology, one of the Furies (q.v.).

**ALEKHINE, Alexander.** Russian chess champion. He was born in Moscow, Nov. 1, 1892, educated at Leningrad, took his degree in law and entered the foreign office. He became known as a chess player in 1909, while still a youth, and his reputation grew until in 1927 he became the world champion by beating Capablanca. He also holds the record for blind-fold chess. He has written several books on chess, of which there are English translations.

**ALEMAN** (à-le-màn'), **Mateo.** A Spanish novelist, born about the middle of the sixteenth century, died in 1610. His fame rests on his *Life and Adventures of the Rogue Guzman de Alfarache* (translated into French in 1600 and into English in 1623), one of the best of the *picaresque* or rogue novels, which give such a lively picture of the shady classes of society in Spain during the sixteenth and seventeenth centuries. The hero becomes in succession stable-boy, beggar, porter, thief, man of fashion, soldier, valet, merchant, student, robber, galley-slave, and lastly his own biographer.

**ALEMANNI,** or **ALAMANNI.** A confederacy of several German tribes which, at the commencement of the third century after Christ, lived near the Roman territory, and came then and subsequently into conflict with the imperial troops. Caracalla first fought with them in 213, but did not conquer them; Severus was likewise unsuccessful. About 250 they began to cross the Rhine westwards, and in 255 they overran Gaul along with the Franks. In 259 a body of them was defeated in Italy at Milan, and in the following year they were driven out of Gaul by Postumus. But the Alemanni did not desist from their incursions, notwithstanding the numerous defeats they suffered at the hands of the Roman troops.

In the fourth century they crossed the Rhine and ravaged Gaul, but were severely defeated by the Emperor Julian and driven back. Subsequently they occupied a considerable territory on both sides of the Rhine; but at last Clovis broke their power in 496 and deprived them of a large portion of their possessions. Part of their territory was formed into a duchy called Alemannia or Swabia, this name being derived from Suevi or Swabians, the name which they gave themselves. It is from the Alemanni that the French have derived their names for Germans and Germany in general, namely, **Allemands** and **Allemagne,** though strictly speaking only the modern Swabians and northern Swiss are the proper descendants of that ancient race.

**ALEMBERT** (à-làṇ-bâr), **Jean le Rond d'.** A French mathematician and philosopher, born in Paris, 16th Nov., 1717, and died there 29th Oct., 1783. He was the illegitimate son of Madame de Tencin and Chevalier Destouches, and was exposed at the Church of St. Jean le Rond (hence his name) soon after birth. He was brought up by the wife of a poor glazier, and with her he lived for more than forty years. His parents never publicly acknowledged him, but his father settled upon him an income of 1200 livres.

He showed much quickness in learning, entered the College Mazarin at the age of twelve, and studied mathematics with enthusiasm and success, but received little encouragement from his teachers. Having left college he studied law and became an advocate, but did not practise, and long continued to occupy himself with mathematics, in which he made immense advances by his own efforts, often arriving at results that other mathematicians had previously arrived at unknown to him. A pamphlet on the motion of solid bodies in a fluid, and another on the integral calculus, which he laid before the Academy of Sciences in 1739 and 1740, showed him in so favourable a light that the Academy received him in 1741 into the number of its members. He soon after published his famous work on dynamics, *Traité de Dynamique* (1743) and another work dealing with fluids, *Traité des Fluides*.

His *Réflexion sur la cause générale des vents* was also a work that added to D'Alembert's reputation.

He also took a part in the investigations which completed the discoveries of Newton respecting the motion of the heavenly bodies, and published at intervals various important astronomical dissertations—on the perturbations of the planets, for instance, and on the precession of the equinoxes—as well as on other subjects. He also took part, with Diderot and others, in the celebrated *Encyclopédie* in 33 vols., for which he wrote the *Discours Préliminaire*, as well as many philosophical and almost all the mathematical articles. Literature, history, and philosophy also received attention from him, and his *Éléments de Philosophie* (1759), in which he agrees with the theories of Condillac and Locke, was a work of much value. His great philosophical aim seems to have been the idea of secularizing morality upon a rational basis. Among his miscellaneous works are *Mélanges de Philosophie, d'Histoire, et de Littérature*; *Traduction de quelques Morceaux choisis de Tacite*; *Sur la Destruction des Jésuites*; *Histoire des Membres de l'Académie Française*; *Éléments de Musique théorique et pratique*.

He received an invitation from the Russian empress Catherine II. to go to St. Petersburg (now Leningrad) as tutor to her son, a very large sum being offered; and Frederick the Great invited him to settle in Berlin, but in vain. From Frederick, however, he accepted a pension, and he also paid a visit to Berlin. There was an intimate friendship between him and Voltaire. He never married, but he was on terms of the closest friendship with Madame L'Espinasse, and they occupied the same house for a number of years. He was held in high esteem by David Hume, who left him a legacy of £200.

**ALEM'BIC.** A simple apparatus sometimes used by chemists for distillation, and consisting of three main parts, body, head, and receiver. The *cucurbit*, or body, contains the substance to be distilled, and is usually somewhat like a bottle, bulging below and narrowing towards the top; the *head*, of a globular form, with a flat under-ring, fits on to the neck of the cucurbit, condenses the vapour from the heated liquid, and receives the distilled liquid on the ring enclosing the neck of the lower vessel, and thus causes it to find egress by a discharging-pipe into the third section, called the *receiver*. *See* DISTILLATION.

**ALEMTEJO** (à-lăn-tā'zhō; "beyond the Tagus"). The largest province of Portugal, and the most southern except Algarve; area, 9219 sq. miles; pop. 576,020. The capital is Evora. It has about 30 miles of coast, but no good harbour and no navigable river. Large areas are devoted to pasturage, and the cultivated portions are comparatively limited, though in the east there are fertile valleys where grain, fruits, etc., are cultivated. There are valuable cork forests in this portion also. Excellent horses are reared. Copper and iron mines are worked; but on the whole this province is in a backward condition, and is the most thinly inhabited in the country.

**ALENÇON** (à-lăn-sōn). A town of France, capital of department Orne, and formerly of the Duchy of Alençon, on the right bank of the Sarthe, 105 miles west by south of Paris; well built; has a fine Gothic church (fifteenth century) and interesting remains of the old castle of the dues d'Alençon. Alençon was long famed for its point-lace, called "point d'Alençon," an industry established at the instigation of Colbert in 1673 but now much fallen off; it has cotton and flax spinning and weaving, etc. Fine rock-crystal, yielding the so-called "diamants d'Alençon," is found in the neighbouring granite quarries. Alençon is mentioned as a city for the first time in 717. Pop. 16,688.

**Alençon,** originally a county, later a dukedom, became united with the crown in 1221, and was given by Louis XI. as an appanage to his fifth son, with whom the branch of the Alençon-Valois commenced. The first duke of the name lost his life at the battle of Agincourt in 1415; another, called Charles IV., married the celebrated Margaret of Valois, sister of Francis I. He commanded the left wing of the French army at the battle of Pavia, where, instead of supporting the king at a critical moment, he fled at the head of his troops, the consequence of which was the loss of the battle and the capture of the king.

**ALEP'PO.** A city in North Syria, on the River Koik, in a fine plain 60 miles south-east of Alexandretta, which is its port, and 129 miles N.N.E. of Damascus. It has a circumference of about 7 miles, and consists of the old town and numerous suburbs. Its appearance at a distance is striking and the houses are well built of stone. On a hill stands the citadel, and at its foot the governor's palace. Previous to 1822 Aleppo contained about 100 mosques, but in that year an earthquake laid the greater part of them in ruins, and destroyed nearly the

whole city. The aqueduct built by the Romans is the oldest monument of the town.

Among the chief attractions of Aleppo are its gardens, in which the pistachio-nut is extensively cultivated. The branch railway to Hamah from the Beyrout-Damascus line has been continued to Aleppo. Formerly the city was a great centre of trade and manufactures, but the earthquake and other causes have combined greatly to lessen its prosperity. It has still a trade, however, in the products of the country, such as wool, cotton, silk, wax, skins, soap, tobacco, etc., and imports a certain quantity of European manufactures.

Aleppo was a place of considerable importance in very remote times. By the Greeks and Romans it was called *Berœa*. It was conquered by the Arabs in 638, and its original name *Chalybon* was then turned into *Haleb*, whence the Italian form *Aleppo*. The town was occupied by British troops on 27th Oct., 1918. Its population, 200,000 at the beginning of last century, is now estimated at 177,313. The language generally spoken is Arabic. The vilayet of Aleppo has a pop. of 1,500,000.

**ALESH'KI.** A town of Southern Russia, government Taurida. Pop. 8915.

**ALE'SIA.** A town and fortress of ancient Gaul, at which in 52 B.C. Julius Cæsar inflicted a crushing defeat on the Gauls under Vercingetorix. It is now represented by the village of Alise, department Côte d'Or, near which Napoleon III. erected a colossal statue of Vercingetorix in 1865.

**ALESSAN'DRIA.** A town and fortress in North Italy, capital of the province of the same name, in a marshy country, near the junction of the Bormida and the Tanaro. It was built in 1168 by the Cremonese and Milanese, and was named in honour of Pope Alexander III., who made it a bishop's see. It has a cathedral, important manufactures of linen, woollen, and silk goods, and an active trade. It ranks as one of the first fortresses of Europe, the fortifications including a surrounding wall and bastions, and a strong citadel on the opposite side of the Tanaro, connected by a bridge with the town. Pop. (town), 81,979; (province), 840,000.

**ALES'SI, Galeazzo.** A distinguished Italian architect, born at Perugia, 1512, died there in 1572. Many palaces, villas, and churches were erected after his designs, and at the request of Philip II. of Spain he drew a plan for the Escurial.

**ALETSCH'-GLACIER.** The greatest glacier in Switzerland, canton Valais, a prolongation of the immense mass of glaciers connected with the Jungfrau, the Aletschhorn (13,721 feet), and other peaks; about 15 miles long.

**ALEURITES.** A tree belonging to the nat. ord. Euphorbiaceæ, is found in tropical and subtropical parts of the world. **Aleurites triloba,** the "candleberry tree," is cultivated in the Moluccan Islands for its fruit. The oil extracted from its seeds is valuable both for food and light.

**ALEUROM'ETER.** An instrument for indicating the bread-making qualities of wheaten flour. The indications depend upon the expansion of the gluten contained in a given quantity of flour when freed of its starch by pulverisation and repeated washings with water.

**ALEU'TIAN ISLANDS.** A chain of about eighty small islands belonging to the United States, separating the Sea of Kamchatka from the northern part of the Pacific Ocean, and extending nearly 1200 miles from east to west between lon. 172° E. and 163° W.; total area, 6391 sq. miles; pop. 1220. They are of volcanic formation, and in a number of them there are volcanoes still in activity. Their general appearance is dismal and barren, yet grassy valleys capable of supporting cattle throughout the year are met with, and potatoes, turnips, and other vegetables are successfully cultivated. They afford also an abundance of valuable fur and of fish. The natives belong to the same stock with those of Kamchatka.

**ALE'WIFE** (corruption of the Indian name). The *Alosa tyrannus*, a fish of the same genus as the shad, growing to the length of 12 inches, and caught in great quantities in the mouths of the rivers of New England, New Brunswick, and Nova Scotia, being salted and exported.

**ALEXANDER,** surnamed **the Great.** The son of Philip of Macedon and his queen Olympias, was born at Pella, 356 B.C. In youth he had Aristotle as instructor, and he early displayed uncommon abilities. The victory of Chæronea in 338, which brought Greece entirely under Macedonia, was mainly decided by his efforts. Philip having been assassinated, 336 B.C., Alexander, not yet twenty years of age, ascended the throne.

His father had been preparing an expedition against the Persians, and Alexander determined to carry it out; but before doing so he had to chastise the barbarian tribes on the frontiers

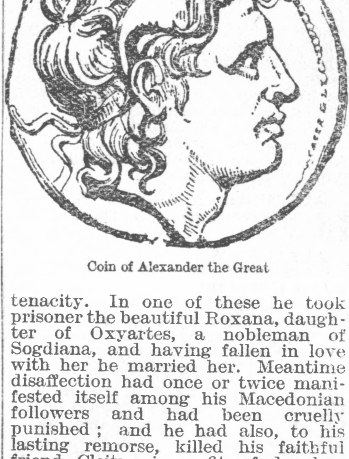
of Macedon as well as quell a rising in Greece, in which he took and destroyed Thebes, put 6000 of the inhabitants to the sword, and carried 30,000 into captivity.

Leaving Antipater to govern in his stead in Europe, and being confirmed as commander-in-chief of the Greek forces in the general assembly of the Greeks, he crossed over the Hellespont into Asia, in the spring of 334, with 30,000 foot and 5000 horse. His first encounter with the Persian forces (assisted by Greek mercenaries) was at the small river Granicus, where he gained a complete victory. Most of the cities of Asia Minor now opened their gates to the victor, and Alexander restored democracy in all the Greek cities. In passing through Gordium he cut the Gordian knot, on which it was believed the fate of Asia depended, and then conquered Lycia, Ionia, Caria, Pamphylia, and Cappadocia.

A sickness, caused by bathing in the Cydnus (333 B.C.), checked his progress; but scarcely was he restored to health when he continued his advance, and this same year defeated the Persian emperor Darius and his army of 500,000 or 600,000 men (including 50,000 Greek mercenaries) near Issus (inner angle of the Gulf of Alexandretta). Darius fled towards the interior of his dominions, leaving his family and treasures to fall into the hands of the conqueror. Alexander did not pursue Darius, but proceeded southwards, and secured all the towns along the Mediterranean Sea, though he only got possession of Tyre (taken 332 B.C.) after besieging it for seven months. Palestine and Egypt now fell before him, and in the latter he founded Alexandria, which became one of the first cities of ancient times. Hence he went through the desert of Libya, to consult the oracle of Zeus Ammon, and it was said that the god recognised him as his son.

On his return Alexander marched against Darius, who had collected an immense army in Assyria, and rejected the proposals of his rival for peace. A battle was fought at Gaugamela, about 50 miles from Arbela, 331 B.C., and notwithstanding the immense numerical superiority of his enemy, Alexander (who had but 40,000 men and 7000 horse) gained a complete victory. Babylon and Susa opened their gates to the conqueror, who marched towards Persepolis, the capital of Persia, and entered it in triumph. He now seems for a time to have lost his self-command. He gave himself up to arrogance and dissipation, and is said in a fit of intoxication to have set fire to the palace of Persepolis, one of the wonders of the world. Rousing himself up, however, he set out in pursuit of Darius, who, having lost his throne, was kept prisoner by Bessus, satrap of Bactriana. Bessus, on seeing himself closely pursued, caused Darius to be assassinated (330 B.C.).

Continuing his progress, he subdued Bessus, and advanced to the Jaxartes, the extreme eastern limit of the empire, but did not fully subdue the whole of this region till 328, some fortresses holding out with great



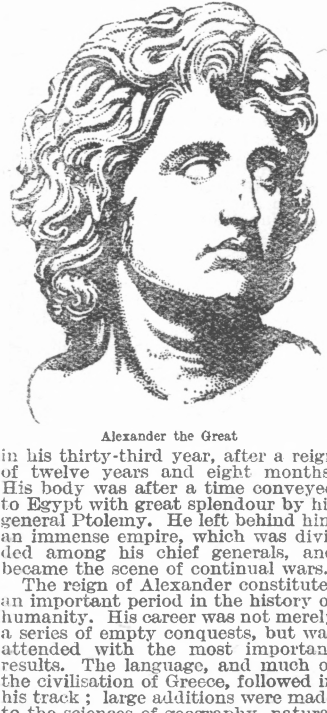
Coin of Alexander the Great

tenacity. In one of these he took prisoner the beautiful Roxana, daughter of Oxyartes, a nobleman of Sogdiana, and having fallen in love with her he married her. Meantime disaffection had once or twice manifested itself among his Macedonian followers and had been cruelly punished; and he had also, to his lasting remorse, killed his faithful friend Cleitus in a fit of drunken rage.

Alexander now formed the idea of conquering India, then scarcely known even by name. He passed the Indus (326 B.C.), marched towards the Hydaspes (Jhelum), at the passage of which he conquered a king named Porus in a fierce battle, and advanced victoriously through the north-west of India, and intended to proceed as far as the Ganges, when the murmurs of his army compelled him to return. On the Hydaspes he built a fleet, in which he sent a part of his army down the river, while the rest proceeded along the banks. By the Hydaspes he reached the Acesines (Chenab), and thus the Indus, down which he sailed to the sea. Nearchus, his admiral, sailed hence to the Persian Gulf, while Alexander directed his march by land

to Babylon, losing a great part of his troops in the desert through which he had to pass. In Susa he married Statira, the eldest daughter of Darius, and rewarded those of his Macedonians who had married Persian women, because it was his intention to unite the two nations as closely as possible.

At Opis, on the Tigris, a mutiny arose among his Macedonians (in 324), who thought he showed too much favour to the Asiatics; by firmness and policy he succeeded in quelling this rising, and sent home 10,000 veterans with rich rewards. Soon after, his favourite, Hephæstion, died at Ecbatana, and Alexander's grief was unbounded. The favourite was royally buried at Babylon, and here Alexander was engaged in extensive plans for the future, when he became suddenly sick, after a banquet, and died in a few days (323 B.C.),



Alexander the Great

in his thirty-third year, after a reign of twelve years and eight months. His body was after a time conveyed to Egypt with great splendour by his general Ptolemy. He left behind him an immense empire, which was divided among his chief generals, and became the scene of continual wars.

The reign of Alexander constitutes an important period in the history of humanity. His career was not merely a series of empty conquests, but was attended with the most important results. The language, and much of the civilisation of Greece, followed in his track; large additions were made to the sciences of geography, natural history, etc.; a road was opened to India; and the products of the farthest east were introduced into Europe. Greek kingdoms, under his generals and their successors, continued to exist in Asia for centuries. —BIBLIOGRAPHY: B. I. Wheeler, *Alexander the Great* (Heroes of the Nations Series: Putnam); Grote, *History of Greece*; Holm, *History of Greece*; Dodge, *Alexander* (Great Captains Series).

**ALEXANDER.** The name of eight popes, the earliest of whom, **Alexander I.**, is said to have reigned from 108 to 119. **Alexander III.**, elected 1159, died 1181, exercised his authority with great vigour against Henry II. when the latter was accused of the assassination of Thomas Becket. The most famous (or infamous) is **Alexander VI.** (Borgia), who was born at Valencia, in Spain, in 1431, and died in 1503. When he was only twenty-five years of age his uncle, Pope Calixtus III., made him a cardinal, and shortly afterwards appointed him to the dignified and lucrative office of vice-chancellor. By bribery he prepared his way to the papal throne, which he attained in 1492, after the death of Innocent VIII. Both the authority and revenues of the popes being at this time much impaired, he set himself to reduce the power of the Italian princes, and seize upon their possessions for the benefit of his own family. To effect this end he is said not to have scrupled to use the vilest means, including poison and assassination.

His policy, foreign as well as domestic, was faithless and base, and his private life was stained by immorality. He understood how to extract immense sums of money from all Christian countries under various pretexts. He sold indulgences, and set aside, in favour of himself, the wills of several cardinals. His excesses roused against him the powerful eloquence of Savonarola, who, by pen and pulpit, urged his deposition, but had to meet his death at the stake in 1498.

Not long after his election Alexander had the honour of deciding the dispute between the kings of Portugal and Castile concerning their respective claims to the foreign countries recently discovered. It must, however, be admitted that Pope Alexander, whilst striking the wealthy and powerful, interested himself in the welfare of the people, and that he was a patron of arts and letters. His son, Cesare Borgia, and his daughter, Lucrezia, are equally notorious with himself.

**ALEXANDER.** The name of three Scottish kings. **Alexander I.**, a son of Malcolm III., Canmore, and Margaret of England, succeeded his brother

Edgar in 1107, and governed with great ability till his death in 1124. He was a great benefactor of the Church, and a firm vindicator of the national independence.

**Alexander II.** was born in 1198, and succeeded his father, William the Lion, in 1214. He was a wise and energetic prince, and Scotland prospered greatly under him, though disturbed by the Norsemen, by the restlessness of some of the Celtic chiefs, and by the attempts of Henry III. of England to make Alexander do homage to him. He helped Robert FitzWilliam to capture London and compel King John to sign Magna Carta. Alexander married Henry's sister, Joan, in 1221, who lived till 1238. In 1244 war with England almost broke out, but was fortunately averted. Alexander died in 1248 at Kerrera, an island opposite Oban, when on an expedition in which he hoped to wrest the Hebrides from Norway.

He was succeeded by his son, **Alexander III.**, a boy of eight, who in 1251 married Margaret, eldest daughter of Henry III. of England. Like his father, he was eager to bring the Hebrides under his sway, and this he was enabled to accomplish in a few years after the defeat of the Norse King Haco at Largs, in 1263. The mainland and islands of Scotland were now under one sovereign, though Orkney and Shetland still belonged to Norway. Alexander was strenuous in asserting the independence both of the Scottish kingdom and the Scottish Church against England. He died in 1285 by the falling of his horse while he was riding in the dark between Burntisland and Kinghorn. He left as his heiress Margaret, the Maid of Norway, daughter of Eric of Norway, and of Alexander's daughter, Margaret. Under him Scotland enjoyed greater prosperity than for generations afterwards.

**ALEXANDER.** King of Yugoslavia. Born Dec. 17, 1888, he was a son of King Peter of Serbia. In 1909, his elder brother, George, having renounced his claim, he became heir apparent. He served with the army in 1912-13 against the Turks and also in the Great War. In Aug., 1921, he became king of the new state of Yugoslavia, an enlargement of Serbia, and in 1922 he married a princess of Romania. A son, Peter, was born in 1923. In 1928 Alexander suspended the constitution and made himself a dictator, but constitutional government was restored in 1931.

**ALEXANDER.** Prince of Bulgaria. He belonged to the family that ruled over Hesse and was born April 5, 1857. He served in the Russian Army against the Turks in 1877 and in 1879 Russian influence secured for him the position of first Prince of Bulgaria. He enlarged the area of the country and was successful in a war with the Serbians, but offended his Russian supporters. In 1886 he abdicated, and as Count Hartenau lived in retirement until his death, Nov. 17, 1893.

**ALEXANDER I.** Emperor of Russia, son of Paul I. and Maria, daughter of Prince Eugene of Württemberg, was born in 1777 and died in 1825. On the assassination of his father, in 1801, Alexander ascended the throne, and one of his first acts was to conclude peace with Britain, against which his predecessor had declared war. In 1803 he offered his services as mediator between England and France, and two years later a convention was entered into between Russia, England, Austria, and Sweden for the purpose of resisting the encroachments of France on the territories of independent States. He was present at the battle of Austerlitz (1805), when the combined armies of Russia and Austria were defeated by Napoleon. In the succeeding campaign the Russians were again beaten at Eylau (8th Feb., 1807) and Friedland (14th June), the result of which was an interview between Alexander and Napoleon, and the treaty at Tilsit.

The Russian emperor now for a time identified himself with the Napoleonic schemes, and soon obtained possession of Finland and an extended territory on the Danube. The French alliance, however, he found to be too oppressive, and his having separated himself from Napoleon led to the disastrous French invasion of 1812. In 1813 he published a manifesto which served as the basis of the coalition of the other European powers against France, which was followed by the capture of Paris (in 1814), the abdication of Napoleon and the restoration of the Bourbons, and the utter overthrow of Napoleon the following year. After Waterloo, Alexander, accompanied by the Emperor of Austria and the King of Prussia, made his second entrance into Paris, where they concluded the treaty known as the Holy Alliance. The remaining part of his reign was chiefly taken up with measures of internal reform, including the gradual abolition of serfdom and the promotion of education, agriculture, commerce, and manufactures, as well as literature and the fine arts.

**ALEXANDER II.** Emperor of

Russia, was born 29th April, 1818, and succeeded his father Nicholas in 1855, before the end of the Crimean war. After peace was concluded, the new emperor set about effecting reforms in the empire, the greatest of all being the emancipation of the serfs in 1861, a measure which gave freedom, on certain conditions, to 50,000,000 of human beings who were previously in a state little removed from that of slavery. Under him, too, representative assemblies in the provinces were introduced, and he also did much to improve education, and to reorganise the judicial system. During his reign the Russian dominions in Central Asia were extended, a piece of territory south of the Caucasus, formerly belonging to Turkey, was acquired, and a part of Bessarabia restored to Russia. The latter additions resulted from the Russo-Turkish war of 1877-8. He was killed by an explosive missile flung at him by a Nihilist in a street in St. Petersburg (now Leningrad), 13th March, 1881. He was succeeded by his son, Alexander III. His only daughter was married to the Duke of Edinburgh.

**ALEXANDER III.** Emperor of Russia, son of Alexander II., born in 1845, became heir to the throne on the death of his eldest brother, Nicholas (1865). In 1863 he married Princess Dagmar of Denmark; he succeeded to the throne in 1881, on the assassination of his father, being crowned in Moscow in 1883. He gave up the reforms begun by his father, and ruled in the old autocratic fashion, restricting the liberties of Finland and the Baltic Provinces, and encouraging persecution of the Jews. He spent much time in the closely-guarded castle of Gatchina, to be safe from Nihilistic attempts, several of which he narrowly escaped. He endeavoured to put down corruption and underhand dealing among the bureaucracy, and in his own habits gave an example of simplicity and economy. While showing himself suspicious of Germany and Austria-Hungary, he entered on friendly relations with France. He began to suffer from disease of the kidneys in 1893, and died at Livadia on 1st Nov,. 1894. He was succeeded by his eldest son, Nicholas II.

**ALEXANDER I.** King of Serbia, born in 1876. He was the son of King Milan, and on the abdication of his father in 1889 was proclaimed king under a regency. He married Madame Draga Mashin, a widow, who was much older than himself. Both were assassinated on 11th June, 1903.

**ALEXANDER OF HALES.** *See* HALES, ALEXANDER DE.

**ALEXANDER, Albert Victor.** British politician. Born at Weston-super-Mare, May 1, 1885, he became associated with the Co-operative movement. He served with the forces during the World War and in 1920 was appointed secretary to the parliamentary committee of the Co-operative Congress. In 1922 he was elected M.P. for the Hillsborough Division of Sheffield; in 1924 he became parliamentary secretary to the Board of Trade, and in 1929 First Lord of the Admiralty. He resigned in August, 1931, and lost his seat in Parliament in the following October.

**ALEXANDER, Boyd.** British explorer and naturalist, born in 1873. He led many expeditions for research and exploration to the Cape Verde Islands, the Zambesi River, and various parts of the world. He also discovered many new birds when he ascended the Mount St. Isabel. In 1908 he received the gold medal of the Royal Geographical Society. He was murdered by natives in May, 1910, while exploring the French Congo. He wrote *From the Niger to the Nile* (1907), etc. *Boyd Alexander's Last Journey* was published in 1912.

**ALEXANDER NEVSKOI.** A Russian hero and saint, son of the Grand-Duke Jaroslav, born in 1219, died in 1263. He fought valiantly against assaults of the Mongols, the Danes, Swedes, and Knights of the Teutonic Order. He gained the name of **Nevskoi** in 1240, for a splendid victory on the Neva, over the Swedes. The gratitude of his countrymen commemorated the hero in popular songs, and raised him to the dignity of a saint. Peter the Great built a splendid monastery at St. Petersburg (Leningrad) in his honour, and in memory of him established the Order of Alexander Nevskoi.

**ALEXANDER SEVE'RUS.** A Roman emperor, born in 208, died A.D. 235. He was raised to the imperial dignity in A.D. 222 by the prætorian guards, after they had put his cousin the Emperor Heliogabalus to death. He governed ably both in peace and war; and also occupied himself in poetry, philosophy, and literature. He was very tolerant in religious matters, and although not professing Christianity, intended to erect a temple to Christ, but was prevented by the pagan priests from carrying out this plan. In 232 he defeated the Persians under Artaxerxes, who wished to drive the Romans from Asia. When on an expedition into Gaul, to repress an incursion of the Germans, he was

murdered with his mother in an insurrection of his troops, headed by the brutal Maximin, who succeeded him as emperor.

**ALEXANDER, Sir George.** English actor. He was born at Reading, June 19, 1858. In 1880 he joined Irving, in whose companies he played for the next eight years. He then took his own theatre in London, the Avenue, but in 1891 he moved to the S. James's, where he remained until his death, March 16, 1918. In 1911 he was made a knight.

Sir George was most successful in comedies of modern society, in which he took the part of a suave man of the world. This was seen when he played in such pieces as *Lady Windermere's Fan*; *His House in Order* and *The Second Mrs. Tanqueray*.

**ALEXANDERS** (*Smyrnium Olusātrum*). An umbelliferous biennial plant, a native of the Mediterranean region, but found in Great Britain and Ireland. It was formerly cultivated for its leaf-stalks, which, having a pleasant aromatic flavour, were blanched and used instead of celery —a vegetable that has taken its place.

**ALEXANDRA.** The queen mother, widow of Edward VII., daughter of Christian IX., King of Denmark, was born at Copenhagen on 1st Dec., 1844, and was married on 10th March, 1863, being Princess of Wales up to the death of Queen Victoria and the accession of King Edward in Jan., 1901. She was highly popular from the first in the country of her husband, as she constantly showed an interest in all benevolent causes. She has been the mother of six children, one of whom died in infancy, while the eldest, Albert Victor, Duke of Clarence and Avondale, died in 1892 at the age of twenty-eight. She died 20th Nov., 1925.

**ALEXANDRET'TA,** or **ISKANDEROON** (ancient **ALEXANDRIA AD ISSUM**). A small seaport in Asia Minor, on the Gulf of Iskanderoon, the port of Aleppo and Northern Syria. Named after Alexander the Great, and founded in memory of the battle of Issus. In 1832 Mehemet Ali won a victory over the Turks near Alexandretta. There is a large export and import trade. It was occupied by British and French troops in Nov., 1918. Pop. 13997.

**ALEXAN'DRIA.** An ancient city and seaport in Egypt, at the north-west angle of the Nile delta, on a ridge of land between the sea and Lake Mareotis. Ancient Alexandria was founded by, and named in honour of, Alexander the Great, in 332 B.C., and was long a great and splendid city, the centre of commerce between the east and west, as well as of Greek learning and civilisation, with a population at one time of perhaps 1,000,000. It was especially celebrated for its great library, and also for its famous lighthouse, one of the wonders of the world, standing upon the little island of Pharos, which was connected with the city by a mole.

Under Roman rule it was the second city of the empire, and when Constantinople became the capital of the East it still remained the chief centre of trade; but it received a blow from which it never recovered when captured by Amru, general of Caliph Omar, in 641, after a siege of fourteen months. Its ruin was finally completed by the building of Cairo (969) and the discovery of the passage to India by the Cape of Good Hope (1498) which opened up a new route for the Asiatic trade. *See* ALEXANDRIAN LIBRARY, ALEXANDRIAN SCHOOL.

Modern Alexandria stands partly on what was formerly the island of Pharos, partly on the peninsula which now connects it with the mainland and which was formed by the accumulation of soil, and partly on the mainland. The streets in the Turkish quarter are narrow, dirty, and irregular; in the foreign quarter they are regular and wide, and it is here that the finest houses are situated. Here also are the principal shops and hotels, banks, offices of companies, etc.; this part of the city being supplied with gas, and with water brought by the Mahmudieh Canal from the western branch of the Nile. Alexandria is connected by railway with Cairo, Rosetta, and Suez. A little to the south of the city are the catacombs, which now serve as a quarry. Another relic of antiquity is Pompey's Pillar, 98 feet 9 inches high.

Alexandria has two ports, on the east and west respectively of the isthmus of the Pharos peninsula, the latter having a breakwater over 3000 yards in length, with fine quays and suitable railway and other accommodation. The trade of Alexandria is large and varied, the exports being cotton, beans, peas, rice, wheat, etc.; the imports chiefly manufactured goods, machinery, timber, and coal. The origin of its more recent career of prosperity it owes to Mohammed Ali. In 1882 the insurrection of Arabi Pasha and the massacre of Europeans led to the intervention of the British and the bombardment of the forts by the British fleet in July. The administrative district has an area of

19 sq. miles. The population at the 1927 census was 573,063.

**ALEXANDRIA.** A town and port of the United States, in Virginia, on the right bank of the Potomac (which is of sufficient depth for large vessels), 7 miles south of Washington, carries on a considerable trade, chiefly in flour. Pop. 24,149.

**ALEXANDRIA.** A town of Scotland, in Dumbartonshire, on the Leven, with cotton-printing and bleaching works. It is in Bonhill parish, which had a pop. in 1931 of 15,565.

**ALEXANDRIA.** A town of the Ukraine, in the former Russian government of Kherson, on a tributary of the Dnieper. Pop. 10,521.

**ALEXANDRIAN LIBRARY.** The largest and most famous of all the ancient collections of books, founded by Ptolemy Soter (died 283 B.C.), King of Egypt, and greatly enlarged by succeeding Ptolemies. The first librarian was Zenodotus (234 B.C.). At its most flourishing period it is said to have numbered 700,000 volumes, accommodated in two different buildings, one of them being the Scrapeion, or temple of Jupiter Serapis. The other collection was burned during Julius Cæsar's siege of the city, but the Serapeion library existed to the time of the Emperor Theodosius the Great, when, at the general destruction of the heathen temples, the splendid temple of Jupiter Serapis was gutted (A.D. 391) by a fanatical crowd of Christians and its literary treasures destroyed or scattered.

A library was again accumulated, but was burned by the Arabs when they captured the city under the caliph Omar in 641. Amru, the captain of the caliph's army, would have been willing to spare the library, but Omar is said to have disposed of the matter in the famous words: "If these writings of the Greeks agree with the Koran they are useless, and need not be preserved; if they disagree they are pernicious and ought to be destroyed." This story, however, which rests solely on the authority of Abulfaragius, a writer who lived six centuries later, is now generally discredited.

**ALEXANDRIAN SCHOOL or AGE.** The school or period of Greek literature and learning that existed at Alexandria in Egypt during the three hundred years that the rule of the Ptolemies lasted (323-30 B.C.), and continued under the Roman supremacy. Ptolemy Soter founded the famous library of Alexandria (see above) and his son, Philadelphus, established a kind of academy of sciences and arts. Many scholars and men of genius were thus attracted to Alexandria, and a period of literary activity set in, which made Alexandria for long the focus and centre of Greek culture and intellectual effort.

It must be admitted, however, that originality was not a characteristic of the Alexandrian age, which was stronger in criticism, grammar and science than in pure literature. Among the grammarians and critics were Zenodotus, Eratosthenes, Aristophanes, Aristarchus, and Zoilus, proverbial as a captious critic. Their merit is to have collected, edited, and preserved the existing monuments of Greek literature. To the poets belong Apollonius, Lycophron, Aratus, Nicander, Euphorion, Callimachus, Theocritus, Philetas, etc. Among those who pursued mathematics, physics, and astronomy was Euclid, the father of scientific geometry; Archimedes, great in physics and mechanics; Apollonius of Perga, whose work on conic sections still exists; Nicomachus, the first scientific arithmetician; and (under the Romans) the astronomer and geographer Ptolemy.

Alexandria also was distinguished in philosophical speculation, and it was here that the New Platonic school was established by Ammonius of Alexandria (about A.D. 193), whose disciples were Plotinus and Origen. Being for the most part Orientals, formed by the study of Greek learning, the writings of the New Platonists are strikingly characterised—for example, those of Ammonius Saccas, Plotinus, Iamblichus, Porphyrius—by a mixture of Asiatic and European elements. The connection of Neo-Platonism with Alexandria is, however, less than is commonly supposed.

—BIBLIOGRAPHY: Mahaffy, *Greek Life and Thought from the Age of Alexander to the Roman Empire*; Kingsley, *Alexandria and her Schools*; Vacherot, *Histoire critique de l'école d'Alexandrie* (3 vols).

**ALEXANDRIAN VERSION.** *See* CODEX ALEXANDRINUS.

**ALEXANDRINE.** In prosody, the name given, from an old French poem on Alexander the Great, to a species of verse, which consists of six iambic feet, or twelve syllables, the pause being, in correct Alexandrines, always on the sixth syllable; for example, the second of the following verses:—

> A needless Alexandrine ends the song,
> That, like a wounded snake, drags its slow length along.

In English Drayton's *Polyolbion* is written in this measure, and the concluding line of the Spenserian stanza is an Alexandrine. In France the

verse fell into disuse during the early part of the sixteenth century, but was again revived by Jean Antoine de Baif, one of the poets of the Pléiade. Jodelle introduced the verse into the drama, and Ronsard made it very popular. French epics and dramas being confined to this verse, it is therefore called the *heroic*.

**ALEXANDRO'POL**, or **LENINAKAN.** Formerly a Russian town and fortress in the Transcaucasian government of Erivan, near the highway from Erivan to Kars; now belonging to Armenia; it has silk manufactories. Pop. 48,938.

**ALEXAN'DROV.** A town of Russia, government of Vladimir, with a famous convent, in the church of which are interred two sisters of Peter the Great; manufactures of steel and cotton goods. Pop. 7179.

**ALEX'ISBAD.** A bathing-place of Germany, Anhalt, in the Harz Mountains, with two mineral springs strongly impregnated with iron.

**ALEX'IS MIKHAI'LOVITSH** (son of Michael). Second Russian Tsar of the line of Romanov, born in 1629, succeeded his father Mikhail Feodorovitsh in 1645, and died in 1676. He did much for the internal administration and for the enlargement of the empire; reconquered Little Russia from Poland, and carried his authority to the extreme east of Siberia. He was father of sixteen children, the most famous of them being Peter the Great and his sister Sophia.

**ALEXIS PETRO'VITSH.** Eldest son of Peter the Great and Eudoxia Lopukhina, repudiated in 1698, was born in Moscow, 1690, and died in 1718. He opposed the innovations introduced by his father, who on this account disinherited him by a ukase in 1718, and when he discovered that Alexis was paving the way to succeed to the crown he had his son tried and condemned to death. A few days afterwards Alexis died, after having received twenty-five strokes with the knout, leaving a son, afterwards the Emperor Peter II.

**ALEX'IUS COMNE'NUS.** Byzantine Emperor, was born in 1048 and died in 1118. He was a nephew of Isaac the first emperor of the Comneni, and attained the throne in 1081, at a time when the Empire was menaced from various sides, especially by the Turks and the Normans. From these dangers he managed to extricate himself by policy or warlike measures, and maintained his position till the age of seventy, during a reign of thirty-seven years. His daughter Anna wrote a life of him (*The Alexiad*), which is one continuous eulogy, but all the Latin historians are very severe on him.

**AL'FA.** *See* ESPARTO.

**ALFAL'FA.** Generally known in Britain as lucerne, a prolific forage plant largely grown in California, etc. This plant is of the pea family and is sometimes grown for green fodder. It is also found growing wild in fields and hedgerows. It has clover-like leaves, hollow branching stems, and yellow or purple flowers.

**ALFARA'BI.** An eminent Arabian scholar of the tenth century; died at Damascus in 950; wrote an Aristotelian philosophy, and compiled a kind of encyclopædia.

**AL'FENID.** An alloy of nickel plated with silver, used for spoons, forks, candlesticks, tea services, etc.

**ALFIERI** (ål-fē-ā'rē), **Vittorio, Count.** Italian poet, was born at Asti in 1749, and died in 1803. After extensive European travels he began to write, and his first play, *Cleopatra* (1775), being received with general applause, he determined to devote all his efforts to attaining a position among writers of dramatic poetry. At Florence he became intimate with the Countess of Albany, wife of Prince Charles Edward Stuart, and on the death of the prince she lived with him as his mistress. This connection he believed to have served to stimulate and elevate his poetic powers. He died at Florence and was buried in the church of Santa Croce, between Macchiavelli and Michelangelo, where a beautiful monument by Canova covers his remains.

He wrote twenty-one tragedies and six comedies. His theatrical work has been rightly styled a creation of his pride as much as of his genius: he endeavoured to turn the theatre into a platform and was constantly preaching from the stage. Anxious to use his characters as exponents of his theories, and to make them *talk*, he often forgot to make them *act*. Alfieri himself admitted that he was writing with a view to "teaching men how to become free, strong, generous, and passionate for real virtue," but such an attitude is opposed to true art. His tragedies are full of lofty and patriotic sentiments, but the language is stiff and without poetic grace, and the plots poor. Nevertheless he is considered the first tragic writer of Italy, and has served as a model for his successors. Alfieri composed also an epic, lyrics, satires, and poetical translations from the ancient classics. He left an interesting autobiography. The best edition of his works is that published at Pisa (1805-13) in 22 vols.

**ALFON'SO.** *See* ALPHONSO.

**AL'FORD, Henry, D.D.** Dean of Canterbury, an English poet, scholar, and miscellaneous writer, was born in London in 1810. After attending various schools he entered Trinity College, Cambridge, in 1827, graduated B.A. in 1832, was elected fellow in 1834, and next year became vicar of Wymeswold, Leicestershire. In 1842 he was appointed examiner in logic and moral philosophy to the University of London, and held the appointment till 1857.

He began the great work of his life early, his edition of the Greek Testament with commentary, which occupied him for twenty years, the first volumes being published in 1849, the fourth and last in 1861. In 1853 he was transferred to Quebec Chapel, London, and in 1857 was appointed Dean of Canterbury. He was the first editor of the *Contemporary Review* (1866-70). He died in 1871. Among other works he wrote *Chapters on the Poets of Ancient Greece, Sermons, Psalms and Hymns, Homilies on the Acts of the Apostles, Letters from Abroad, Poetical Works, Plea for the Queen's English.*

**AL'FRED** (or **ÆL'FRED**) **THE GREAT.** King of England, was born at Wantage, in Berkshire, A.D. 849, his father being Ethelwulf, son of Egbert, King of the West Saxons. He succeeded his brother Ethelred in 872 at a time when the Danes, or Northmen, had extended their conquests widely over the country, and they had completely overrun the kingdom of the West Saxons by 878. Alfred was obliged to flee in disguise.

At length he gathered a small force, and having fortified himself on the Isle of Athelney, formed by the confluence of the Rivers Parret and Tone, amid the marshes of Somerset, he was able to make frequent sallies against the enemy. It was during his abode here that he went, according to legend, disguised as a harper into the camp of King Guthrum (or Guthorm), and, having ascertained that the Danes felt themselves secure, hastened back to his troops, led them against the enemy, and gained such a decided victory that fourteen days afterwards the Danes begged for peace. This battle took place in May, 878, near Edington, in Wiltshire.

Alfred allowed the Danes who were already in the country to remain, on condition that they gave hostages, took a solemn oath to quit Wessex, and embraced Christianity. Their king, Guthrum, was baptized, with thirty of his followers, and ever afterward remained faithful to Alfred. They received that portion of the east of England now occupied by the counties of Norfolk, Suffolk, and Cambridge, as a place of residence.

The few years of tranquillity (886-93) which followed were employed by Alfred in rebuilding the towns that had suffered most during the war, particularly London; in training his people in arms and no less in agriculture; in improving the navy; in systematising the laws and internal administration; and in literary labours and the advancement of learning. He caused many manuscripts to be translated from Latin, and himself translated several works into Anglo-Saxon, such as the *Psalms, Æsop's Fables, Boethius on the Consolation of Philosophy, the History of Orosius, Bede's Ecclesiastical History*, etc. He also drew up several original works in Anglo-Saxon. These peaceful labours were interrupted, about 894, by an invasion of the Northmen, who, after a struggle of three years, were finally driven out.

Alfred died in 901. He had married, in 868, Alswith or Ealhswith, the daughter of a Mercian nobleman, and left two sons: Edward, who succeeded him, and Ethelwerd, who died in 922.—BIBLIOGRAPHY: Plummer, *Life and Times of Alfred the Great*; A. Bowker, *Alfred the Great, Chapters on his Life and Times*; B. A. Lees, *Alfred the Great.*

**ALFRETON.** Urban district of Derbyshire. It is 13¼ miles from Derby and is reached by the L.M.S. Rly. The chief industry is coal mining, but there are hosiery factories here. Pop. (1931), 21,232.

**ALFRISTON.** Village of Sussex. It is 9¼ miles from Eastbourne. One of the most picturesque places in England, it possesses a large church called the Cathedral of the Downs, a clergy house owned by the National Trust, and the Star Inn dating from about 1500.

**ALGÆE** (al'jē). A nat. ord. of cryptogamic or thallogenous plants found for the most part in the sea and fresh water, or on the surface of damp walls, rocks, the bark of trees, and in similar moist situations. They are either some shade of bluish-green, green, brown, or red colour. The higher forms have stems bearing leaf-like expansions, and they are often attached to the rocks by roots, which, however, do not derive nutriment from the rocks. A stem, however, is most frequently absent.

The plants are nourished through their whole surface by the medium in which they live. They vary in size from the microscopic diatoms to forms whose stems resemble those of forest

trees, and whose fronds rival the leaves of the palm. They are entirely composed of cellular tissue, and many are edible and nutritious, as carrageen or Irish-moss, dulse, etc., Kelp, iodine, and bromine are products of various species. The Algæ are also valuable as manure. They are often divided into five orders: Diatomaceæ, Confervaceæ, Fucaceæ, Ceramiaceæ, and Characeæ.

**ALGAR'DI, Alessandro.** One of the chief Italian sculptors of the seventeenth century; born 1602, died 1654. He lived and worked chiefly at Rome; executed the tomb of Leo XI. in St. Peter's, a bronze statue of Innocent X., and a marble relief with life-size figures over the altar of St. Leo there.

**ALGARO'BA-BEAN.** *See* CAROB TREE.

**AL'GAROT.** A violently purgative and emetic white powder, precipitated from chloride of antimony in water; it was used in medicine by the physician Victor Algarotus in the sixteenth century.

**ALGAROT'TI, Francesco, Count.** Born in 1712, died in 1764, an Italian writer on science, the fine arts, etc. He lived for some years in France and for a long time in Germany, Frederick the Great of Prussia having made him chamberlain and count. He wrote *Neutonianismo per le donne*; *Saggi sopra le belle arti*, his principal work on art; poems, letters, etc. Algarotti's works published at Venice in 17 vols. (1791-4) and illustrated by Tesi and Novelli are a *chef d'œuvre* of typography. Frederick the Great erected at Pisa a monument to his memory.

**ALGARVE** (al-gâr'vā). Meaning the land situated in the west. A maritime province of Portugal occupying the southern portion of the country, mountainous but with some fertile tracts. The title, King of Algarve, was held by the Kings of Portugal. Area, 1937 sq. miles; pop. 292,634.

**ALGAU** (âl'gou). A name for the south-western portion of Bavaria and the adjacent parts of Württemberg and Tyrol, intersected by the Algau Alps. The Algau breed of cattle is one of the best in Germany.

**ALGAZZALI** (âl-gâz-ā'lē), **Abu Hamed Mohammed.** An Arabian philosopher, Persian by birth; born 1058, died 1111. A most prolific author, he was an opponent of the prevailing Aristotelian philosophy of the day, and wrote against it the *Destruction of the Philosophers*, answered by Averroes in his *Destruction of the Destruction*.

**AL'GEBRA** (from the Arabic *al*, definite article, and *jabbara*, to make equal). A kind of generalised arithmetic in which numbers or quantities and operations, often also the results of operations, are represented by symbols. Thus the expression $ax+cx+dy^2$ denotes that a number represented by $x$ is to be multiplied by a number represented by $y$, a number $c$ multiplied by a number $z$, a number $d$ by a number $y$ multiplied by itself (or squared), and the sum taken of these three products. So the *equation* (as it is called) $x^2-7x+12=0$ expresses the fact that if a certain number $x$ is multiplied by itself, and this result made less by seven times the number and greater by twelve, the result is 0. In this case $x$ must either be 3 or 4 to produce the given result; but such an equation (or formula) as $(a+b)(a-b)=a^2-b^2$ is always true whatever values may be assigned to $a$ and $b$. Algebra is an invaluable instrument in intricate calculations of all kinds, and enables operations to be performed and results obtained that by arithmetic would be impossible, and its scope is still being extended.

The beginnings of algebraic method are to be found in Diophantus, a Greek of the fourth century of our era, but it was the Arabians that introduced algebra to Europe, and from them it received its name. The first Arabian treatise on algebra was published in the reign of the great Caliph Al Mamun (813-33) by Mohammed Ben Musa. Italian merchants were the first algebraists in Europe, and in 1202 Leonardo Fibonacci of Pisa, who had travelled and studied in the East, published a work treating of algebra as then understood in the Arabian school. From this time to the discovery of printing considerable attention was given to algebra, and the work of Ben Musa and another Arabian treatise, called the *Rule of Algebra*, were translated into Italian.

The first printed work treating on algebra (also on arithmetic, etc.), appeared at Venice in 1494, the author being a monk called Luca Pacioli da Bergo, a Minorite friar. Rapid progress now began to be made, and among the names of those to whom advances are to be attributed are Tartaglia and Geronimo Cardano. About the middle of the sixteenth century the Germany Stifel introduced the signs +, −, √, and Robert Recorde the sign =. The last-named wrote the first English work on algebra in 1557. François Vieta, a French mathematician (1540-1603),

first adopted the method which has led to so great an extension of modern algebra, by being the first who used general symbols for known quantities as well as for unknown. It was he also who first made the application of algebra to geometry. Albert Girard, a Flemish mathematician in the seventeenth century, extended the theory of equations by the introduction of imaginary quantities. The Englishman Harriot, early in the seventeenth century, discovered negative roots, and established the equality between the number of roots and the units in the degree of the equation. He also invented the signs $<$ $>$, and Oughtred that of $\times$.

Descartes, though not the first to apply algebra to geometry, has, by the extent and importance of his applications, commonly acquired the credit of being so. The same discoveries have also been attributed to him as to Harriot, and their respective claims have caused much controversy. He obtained by means of algebra the definition and description of curves. Since his time algebra has been applied so widely in geometry and higher mathematics that we need only mention the names of Fermat, Wallis, Newton, Leibnitz, De Moivre, MacLaurin, Taylor, Euler, D'Alembert, Lagrange, Laplace, Fourier, Poisson, Gauss, Horner, De Morgan, Sylvester, Cayley. Boole, Jevons, and others have applied the algebraic method not only to formal logic but to political economy.—BIBLIOGRAPHY: Chrystal, *Algebra* (2 vols.); Hobson, *Trigonometry*; Hardy, *Pure Mathematics*; Whittaker and Watson, *Modern Analysis*.

**ALGECIRAS** (ăl-*he*-thē'răs) (perhaps Portus Albus of the Romans). A seaport of Spain, on the west side of the Bay of Gibraltar, a well-built town carrying on a brisk coasting trade. It was the first conquest of the Arabs in Spain (711), and was held by them till 1344, when it was taken by Alphonso XI. of Castile after a long siege. Near it, in 1801, Admiral Sir James Saumarez defeated a Franco-Spanish fleet. Differences between France and Germany regarding Morocco led to a conference of European Powers here from 16th Jan.-7th April, 1906. Pop. 20,500.

**ALGERIA.** A French dependency stretching for 650 miles along the north coast of Africa, and having an area of 847,552 sq. miles. It is divided into three northern departments, Algiers, Oran, and Constantine, and into four southern territories.

**Physical features.** The coast-line is about 550 miles in length, and though the indentations are numerous, the harbours are much exposed to the north wind. The country is traversed by the Atlas Mountains, two chains of which—the Great Atlas, bordering on the Sahara, and the Little, or Maritime Atlas, between it and the sea—run parallel to the coast, the former attaining a height of 15,000 feet. The intervals are filled with lower ranges, and numerous transverse ranges connect the principal ones and run from them to the coast, forming elevated tablelands and enclosed valleys. The rivers are numerous, but many of them are mere torrents rising in the mountains near the coast. The Shelif is much the largest. Some of the rivers are largely used for irrigation, and artesian wells have been sunk in some places for the same purpose.

There are, both on the coast and in the interior, extensive salt lakes or marshes (*Shotts*), which dry up to a great extent in summer. The country bordering on the coast, called the *Tell*, is generally hilly, with fertile valleys; in some places a flat and fertile plain extends between the hills and the sea. In the east there are *Shotts* that sink below the sea-level, and into these it has been proposed to introduce the waters of the Mediterranean. The climate varies considerably, according to elevation and local peculiarities. There are three seasons: winter from November to February, spring from March to June, and summer from July to October. The summer is very hot and dry. In many parts of the coast the temperature is moderate and the climate so healthy that Algeria is now a winter resort for invalids.

**Products, etc.** The chief products of cultivation are wheat, barley, and oats, tobacco, cotton, wine, silk, and dates. Early vegetables, especially potatoes and peas, are exported to France and England. A fibre called *alfa*, a variety of esparto, which grows wild on the high plateaux, is exported in large quantities. Cork is also exported. There are valuable forests, in which grow various sorts of pines and oaks, ash, cedar, myrtle, pistachio-nut, mastic, carob, etc. The Australian *Eucalyptus globŭlus* (a gum tree) has been successfully introduced. Agriculture often suffers much from the ravages of locusts. Among wild animals are the lion, panther, hyena, and jackal; the domestic quadrupeds include the horse, the mule, cattle, sheep, and pigs (introduced by the French). Algeria possesses valuable minerals, including iron, copper, lead, sulphur, zinc, antimony, marble (white and red), phosphate, and lithographic stone.

**Trade.** The trade of Algeria has greatly increased under French rule, France, Spain, and England being the countries with which it is principally carried on, and three-fourths of the whole being with France. The exports (besides those mentioned above) are olive-oil, raw hides, wood, wool, tobacco, oranges, etc.; the imports manufactured goods, wines, spirits, coffee, etc. The manufacturing industries are unimportant, and include morocco leather, carpets, muslins, and silks. French money, weights, and measures are generally used. The chief towns are Algiers, Oran, Constantine, Bona, and Tlemsen. There are about 2800 miles of railways opened; there is also a considerable network of telegraph lines.

**People.** The two principal native races inhabiting Algeria are Arabs and Berbers. The former are mostly nomads, dwelling in tents and wandering from place to place, though a large number of them are settled in the Tell, where they carry on agriculture and have formed numerous villages. The Berbers, here called Kabyles, are the original inhabitants of the territory and still form a considerable part of the population. They speak the Berber language, but use Arabic characters in writing. The Jews form a small but influential part of the population. Various other races also exist. Except the Jews, all the native races are Mohammedans. There are now a considerable number of French and other colonists, provision being made for granting them concessions of land on certain conditions. There are over 260,000 colonists of French origin in Algeria, and over 200,000 colonists natives of other European countries (chiefly Spaniards and Italians). Algeria is governed by a governor-general, who is assisted by a council appointed by the French Government. The settled portion of the country, in the three departments of Algiers, Constantine, and Oran, is treated much as if it were a part of France, and each department sends two deputies and one senator to the French chambers. The rest of the territory is under military rule. The colony costs France a considerable sum every year. The total population is 6,553,451, of whom 540,305 live in Southern Algeria.

**History.** The country now called Algeria was known to the Romans as Numidia. It flourished greatly under their rule, and early received the Christian religion. It was conquered by the Vandals in A.D. 430-1, and recovered by Belisarius for the Byzantine Empire in 533-4. About the middle of the seventh century it was overrun by the Saracens. The town of Algiers was founded about 935 by Yussef Ibn Zeiri, and the country was subsequently ruled by his successors and the dynasties of the Almoravides and Almohades. After the overthrow of the latter, about 1269, it broke up into a number of small independent territories.

The Moors and Jews, who were driven out of Spain by Ferdinand and Isabella at the end of the fifteenth century, settled in large numbers in Algeria, and revenged themselves on their persecutors by the practice of piracy. On this account various expeditions were made by Spain against Algeria, and by 1510 the greater part of the country was made tributary. A few years later the Algerians invited to their assistance the Turkish pirate Horush (or Haruj) Barbarossa, who made himself Sultan of Algiers in 1516, but was not long in being taken by the Spaniards and beheaded. His brother and successor put Algiers under the protection of Turkey (about 1520) and organised the system of piracy which was long the terror of European commerce, and was never wholly suppressed till the French occupation. Henceforth the country belonged to the Turkish Empire, though from 1710 the connection was little more than nominal. The depredations of the Algerian pirates were a continual source of irritation to the Christian Powers, who sent a long series of expeditions against them. For instance, in 1815 a United States fleet defeated an Algerian one and forced the Dey to agree to a peace in which he recognised the American flag as inviolable. In 1816 Lord Exmouth with an English fleet bombarded Algiers, and exacted a treaty by which all the Christian slaves were at once released, and the Dey undertook for the future to treat all his prisoners of war as the European law of nations demanded. But the piratical practices of the Algerians were soon renewed.

At last the French determined on more vigorous measures, and in 1830 sent a force of over 40,000 men against the country. Algiers was speedily occupied, the Dey retired, and the country was without a government, but resistance was organised by Abd-el-Kader, an Arab chief whom the emergency had raised up. He began his warlike career of fifteen years by an attack on Oran in 1832, and after an obstinate struggle the French, in Feb., 1834, consented to a peace, acknowledging him as ruling over all the Arab tribes west of the Shelif by the title of Emir of Maskara. War was soon again renewed with varying fortune, and in

1837, in order to have their hands free in attacking Constantine, the French made peace with Abd-el-Kader, leaving to him the whole of Western Algeria except some coast towns. Constantine was now taken, and the subjugation of the province of Constantine followed.

Meanwhile Abd-el-Kader was preparing for another conflict, and in Nov., 1838, he suddenly broke into French territory with a strong force, and for a time the supremacy of the French was endangered. Matters took a more favourable turn for them when General Bugeaud was appointed governor-general in Feb., 1841. In the autumn of 1841 Saida, the last fortress of Abd-el-Kader, fell into his hands, after which the only region that held out against the French was that bordering on Morocco. Early in the following year this also was conquered, and Abd-el-Kader found himself compelled to seek refuge in the adjoining empire. From Morocco Abd-el-Kader twice made a descent upon Algeria, on the second occasion defeating the French in two battles; and in 1844 he even succeeded in raising an army in Morocco to withstand the French. Bugeaud, however, crossed the frontier, and inflicted a severe defeat on this army, while a French fleet bombarded the towns on the coast. The Emperor of Morocco was at length compelled to agree to a treaty, in which he not only promised to refuse Abd-el-Kader his assistance, but even engaged to lend his assistance against him. Reduced to extremities, Abd-el-Kader surrendered on 27th Dec., 1847, and was at first taken to France a prisoner, but was afterwards released on his promise not to return to Algeria. The country was yet far from subdued. The Kabyles, and the Arabs in the south, made protracted resistance, and rose again and again against the yoke which it was attempted to impose upon them. The numerous risings that successively took place thus rendered Algeria a school for French generals, such as Pélissier, Canrobert, St. Arnaud, and MacMahon.

In 1864 MacMahon succeeded Pélissier as governor-general, and had as his first work to put down an insurrection. About this time the Emperor Napoleon III., who had visited the colony, introduced considerable modifications into the government, recognizing that the native races had grievances to complain of, and that the French rulers were in various ways astray in the methods of government adopted. Fresh disturbances broke out in the south nearly every year till 1871 when, owing to the Franco-Prussian war, a great effort was made to throw off the French yoke, the colony being nearly denuded of French soldiers. It was, however, completely suppressed, and in order to remove what was believed to be one principal cause of the frequent insurrections, a civil government was established instead of the military government in the northern parts of the colony. The southern parts, inhabited by nomadic tribes, are still subject to military rule.

When the French took in hand the occupation of Tunis, a rising took place (in 1881) in the west of Algeria under a chieftain who was able to inflict some loss and damage on the French forces and colonists, but with no permanent result. Since then quietness has generally prevailed in the colony, where the French, however, continue to maintain a considerable military force. Owing to this and other expenditure Algeria has always formed a burden on the resources of France. The great aid rendered by Algeria to France during the European War led the French Government to introduce new laws. The law of 4th Feb., 1919, gives French citizenship to all Algerian natives under certain conditions.—

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**ALGESI'RAS.** See ALGECIRAS.

**ALGHERO,** or **ALGHERI** (ål-gā'rō. ål-gā'rē). A fortified town and seaport on the north-west coast of the island of Sardinia, 15 miles south-west of Sassari; the seat of a bishop, with a handsome cathedral. One of the remarkable edifices of Alghero is the Casa Arbia, where Charles V. was lodged. The necropolis of Anghelu Ruju, situated in the vicinity, was excavated in 1904. Pop. 12,500.

**ALGIERS** (al'jērz; Fr., *Alger*). A city and seaport on the Mediterranean, capital of the French colony of Algeria, is situated on the west side of the Bay of Algiers, partly on the slope of a hill facing the sea. The old town, which is the higher, is oriental in appearance, with narrow, crooked streets, and houses that are strong, prison-like edifices. Its crowning point is the Kasbah, or ancient fortress of the Deys, about 500 feet above the sea, now serving as barracks.

**Buildings, etc.** The modern French town, which occupies the lower slope and spreads along the shore, is handsomely built, with broad streets and elegant squares. It contains the Government buildings, the central

military and civil establishments, the residence of the governor-general and the officials of the general and provincial Government, the superior courts of justice, the archbishop's palace and the cathedral, various other churches, including an English church and library, the great commercial establishments, etc. A fine boulevard built on a series of arches, and bordered on one side by handsome buildings, runs along the seafront of the town overlooking the bay, harbour, and shipping. Forty feet below are the quay and railway-station, reached by inclined roads leading from the centre of the boulevard. The harbour is good and capacious, enclosed by piers or jetties, and otherwise improved at great expense, and it and the city are defended by a strong series of fortifications.

Algiers is well provided with educational institutions, including high schools or colleges for law, medicine, literature, mathematics and natural science; besides normal schools, an observatory, public library, etc. Algiers is in every way far the most important place in Algeria.

**Trade.** There is a large shipping trade carried on, especially with Marseilles, Cette, and some of the Spanish ports. Trade routes from the interior and also railways centre in Algiers, and the exports include grain, wine, cattle, wool, ore, tobacco, fruit, olive-oil, etc. Algiers is now an important coaling station. The city possesses widely-extended suburbs.

**Climate.** The climate, though variable, makes it a very desirable winter residence for invalids and other, from colder regions. Though warm, it is bracing. There is a considerable rainfall (average 29 inches), but the dry air and absorbent soil prevent it from being disagreeable. The winter months resemble a bright, sunny English autumn, while the heat of summer is not so intense as that of Egypt. The sirocco or desert wind is troublesome, however, during summer, but in the winter it is merely a pleasant, warm, dry breeze. Hailstorms are not infrequent, but frost and snow in Algiers are so rare as to be almost unknown. Pop. (1931) 257,122.

**ALGIN.** A viscous, gummy substance obtained from certain seaweeds, more especially those of the genus Laminaria. It resembles gelatine and dissolves in water. It can be utilized for all purposes where starch or gum is now required; may be used in cookery for soups and jellies; and in an insoluble form it can be cut, turned, and polished, like horn or vulcanite.

**ALGO'A BAY.** A bay on the south coast of the Cape Province, 425 miles east of the Cape of Good Hope, the only place of shelter on this coast for vessels during the prevailing north-west gales. It was the first landing-place of British immigrants in 1820. The usual anchorage is off Port Elizabeth, on its west coast, a place of large and increasing trade, but open on the east and south-east.

**ALGOL'.** Arabic name of a star in the constellation Perseus (head of Medusa), remarkable as a variable star, changing in brightness from the second to the fifth magnitude.

**ALGO'MA.** A district of Canada, on the north of Lake Superior, forming part of the north-west portion of Ontario, rich in silver, copper, iron, etc. It is about 70,000 sq. miles in area.

**ALGON'QUINS,** or **ALGONKINS.** A family of North American Indians, formerly spread over a great extent of territory, and still forming a large proportion of the Indians of Canada. They consisted of four groups, namely —(1) the eastern group, comprising the Massachusetts, Narragansets, Mohicans, Delawares, and other tribes; (2) the north-eastern group, consisting of the Abenakis, etc.; (3) the western group, made up of the Shawnees, Miamis, Illinois, etc.; and (4) the north-western group, including the Chippewas or Ojibbewas, the largest of all the tribes. The word Algonkin means "at the fish-spearing place."

**ALGORISM,** or **ALGORITHMUS.** In arithmetic, a word derived from the name of Algoritmi, or Al-Khowarizmi, from whose works European scholars received much of their early information concerning Hindu numerals. The word is now used to designate any particular arrangement of numerical work.

**ALGRAPHY.** *See* LITHOGRAPHY.

**ALGUACIL,** or **ALGUAZIL** (ál-gwà-thēl'). In Spain, an officer whose business it is to execute the decrees of a judge; a sort of constable. In ancient times the Alguacil was the great provost of the palace.

**ALGUM.** *See* ALMUG.

**ALHA'GI.** *See* CAMEL'S-THORN.

**ALHAMA** (à-lä'mà; that is, "the bath"). A town of Southern Spain, province of Granada, on the Marchan, 24 miles south-west of Granada, celebrated for its warm medicinal (sulphur) baths and drinking waters. It formed a Moorish fortress, the recovery of which in 1482 by the Spaniards led to the entire conquest of Granada. It was occupied by the

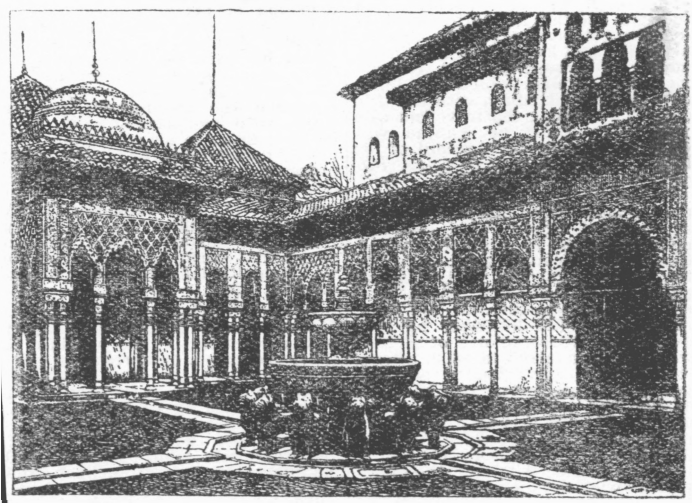
French from Feb., 1810-Aug., 1812, and thrown into ruins by an earthquake in Dec., 1884. Pop. 8000.—There is also an **Alhama** in the province of Murcia, with a warm mineral spring. Pop. 6000.

**ALHAM'BRA** (Ar. *al* and *hamrah*, "the" and "red"). A famous group of buildings in Spain, forming the citadel of Granada when that city was one of the principal seats of the empire of the Moors in Spain, situated on a height, surrounded by a wall flanked by many towers, and having a circuit of 2¼ miles. Within the circuit of the walls are two churches, a number of mean houses, and some straggling gardens, besides the palace of Charles V. and the celebrated Moorish palace which is often distinctively spoken of as the Alhambra. This building, to which the celebrity of the site is entirely due, was the royal palace of the Kings of Granada. The greater part of the present building belongs to the first half of the fourteenth century.

In the course of centuries, both through neglect and acts of vandalism, the beauty of the Alhambra has suffered considerably. The work of restoration was, however, undertaken in 1824 by the architect José Contreras, and continued by his son Rafael from 1847-90. It consists mainly of buildings surrounding two oblong courts, the one, called the Court of the Fishpond (or of the Myrtles), 138 by 74 feet, lying north and south; the other, called the Court of the Lions, from a fountain ornamented with twelve lions in marble, 115 by 66 feet, lying east and west, described as being, with the apartments that surround it, "the gem of Arabian art in Spain, its most beautiful and most perfect example." Its design is elaborate, exhibiting a profusion of exquisite detail gorgeous in colouring, but the smallness of its size deprives it of the element of majesty. The peristyle or portico on each side is supported by 128 pillars of white marble, 11 feet high, sometimes placed singly and sometimes in groups. Two pavilions project into the court at each end, the domed roof of one having been restored. Some of the finest chambers of the Alhambra open into this court, and near the entrance a museum of Moorish remains has been formed. On the opposite side of the Court of the Lions is the Hall of the Abencerrages.

The prevalence of stucco or plaster ornamentation is one of the features of the Alhambra, which becomes especially remarkable in the beautiful honeycomb "stalactite vaulting." Arabesques and geometrical designs with interwoven inscriptions are present in the richest profusion. Cf. Owen Jones's work, *The Alhambra* (2 vols., London, 1842-5).

**ALHAURIN** (ăl-ou-rēn'). A town



Alhambra—The Court of the Lions

of Southern Spain, province of Malaga, with sulphureous baths. Pop. 7000.

**ALI** (ä'lē). Cousin and son-in-law of Mahomet, the first of his converts, and the bravest and most faithful of his adherents, born A.D. 602. He married Fatima, the daughter of the prophet, but after the death of Mahomet (632) his claims to the caliphate were set aside in favour successively of Abu-Bekr, Omar, and Othman. On the assassination of Othman in A.D. 656, he became caliph, and after a series of struggles with his opponents, including Ayesha, widow of Mahomet, finally lost his life by assassination at Kufa in 661.

A Mahommedan schism arose after his death, and has produced two sects. One sect, called the Shiites, put Ali on a level with Mahomet, and do not acknowledge the three caliphs who preceded Ali. They are regarded as heretics by the other sect, called Sunnites. The Turks hold his memory in abhorrence, whilst the Persians call him the Lion of God, and venerate him as second only to the prophet. The *Maxims* and *Hymns* of Ali are yet extant. *See* CALIPH.

**ALI.** Pasha of Yanina, generally called *Ali Pasha*, a bold and able but ferocious and unscrupulous Albanian, born in 1741, son of an Albanian chief, who was deprived of his territories by rapacious neighbours. Ali by his enterprise and success, and by his entire want of scruple, got possession of more than his father had lost, and made himself master of a large part of Albania, including Yanina, which the Porte sanctioned his holding, with the title of pasha. Among the travellers who visited his court at Yanina was Byron, who has left a record of his impressions in *Childe Harold's Pilgrimage*.

Ali Pasha was an apostle of European culture in the East and the first to feel the necessity for energetic reforms in the old Moslem institutions. He displayed excellent qualities, putting an end to brigandage and anarchy, making roads, and encouraging commerce. He still farther extended his sway by subduing the brave Suliotes of Epirus, whom he conquered in 1803, after a three years' war. Aiming at independent sovereignty, he intrigued alternately with England, France, and Russia, and became almost independent of the Porte, which at length determined, in 1820, to pronounce his deposition. Ali resisted several pashas who were sent to carry out this decision, only surrendering at last in 1822, on receiving assurances that his life and property would be granted him. Faith was not kept with him, however; he was killed, and his head was cut off and conveyed to Constantinople, while his treasures were seized by the Porte.

**AL'IAS** (Lat., "at another time"). A word often used in judicial proceedings in connection with the different names that persons have assumed, most likely for prudential reasons, at different times, and in order to conceal identity, as Joseph Smith *alias* Thomas Jones.

**ALIBERT** (ä-lē-bār), **Jean Louis, Baron.** A distinguished French physician, born 1766, died 1837. He was a professor in Paris, and chief physician at the Hospital St. Louis. He wrote many valuable works on medical subjects, such as *Description des maladies de la peau*.

**ALI BEY.** A ruler of Egypt, born in the Caucasus in 1728, was taken to Cairo and sold as a slave, but having entered the force of the Mamelukes, and attained the first dignity among them, he succeeded in making himself virtual governor of Egypt. He then refused the customary tribute to the Porte, and coined money in his own name. In 1769 he took advantage of a war, in which the Porte was then engaged with Russia, to endeavour to add Syria and Palestine to his Egyptian dominion, and in this he had almost succeeded when the defection of his own adopted son, Mohammed Bey, drove him from Egypt. Joining his ally, Sheikh Daher in Syria, he still pursued his plans of conquest with remarkable success, till in 1773 he was induced to make the attempt to recover Egypt with insufficient means. In a battle near Cairo his army was completely defeated and he himself taken prisoner, dying a few days afterwards either of his wounds or by poison.

**AL'IBI** (Lat., "elsewhere"). A defence in criminal procedure, by which the accused endeavours to prove that when the alleged crime was committed he was present in a different place.

**ALICANTE** (ä-lē-kän'tā). A fortified town and Mediterranean seaport in Spain, capital of the province of the same name, picturesquely situated partly on the slope of a hill, partly on the plain at the foot, about 80 miles south by west of Valencia. The lower town has wide and well-built streets; the upper town is old and irregularly built. The principal manufactures are cotton, linen, and cigars; the chief export is wine, which largely goes to England.

Alicante is an ancient town. In

718 it was taken by the Moors, from whom it was wrested about 1240. In modern times it has been several times besieged and bombarded, as by the French in 1709, and in 1812, and by the federalists of Cartagena in 1873. Pop. 73,071.—The province is very fruitful and well cultivated, producing wine, silk, fruits, etc. The wine is of a dark colour (hence called *rino tinto*, deep-coloured wine), and is heavy and sweet. Area, 2185 sq. miles. Pop. 519,379.

**ALICATA**, or **LICATA** (ä-lē-kä'tä, lē-kä'tä). The most important commercial town on the S. coast of Sicily, at the mouth of the Salso, 24 miles E.S.E. of Girgenti, with a considerable trade in sulphur, grain, wine, oil, nuts, almonds, and soda. It occupies the site of the town which the Tyrant Phintias of Acragas erected and named after himself, when Gela was destroyed in 280. Pop. 25,500.

**ALICE MAUD MARY, Princess.** Second daughter of Queen Victoria, Duchess of Saxony, and Grand-duchess of Hesse-Darmstadt, born 1843, died 1878. In 1862 she married Frederick William Louis of Hesse, nephew of the grand-duke, whom he succeeded in 1877. She showed exemplary devotion to her father, Prince Albert, during his fatal illness and to the Prince of Wales during his attack of fever in 1871. During the Franco-Prussian war she organized hospitals for the relief of the sick and wounded. She died from diphtheria caught while nursing her husband and children. A selection of her letters to her mother was published in 1883 by Dr. Carl Sell.

**ALICE SPRINGS.** Town of Australasia, the capital of the territory of Central Australasia. It is 994 miles from Adelaide and 1105 from Port Darwin.

**ALIEN.** In relation to any country, a person born out of the jurisdiction of the country, and not having acquired the full rights of a citizen of it. The position of aliens depends upon the laws of the respective countries, but generally speaking, aliens owe a local allegiance, and are bound equally with natives to obey all general rules as for the preservation of order, which do not relate specially to citizens. Aliens have been often treated with great harshness by the laws of some States. Thus in France there long existed what was known as the *droit d'aubaine*, a law which claimed for the benefit of the State the effects of deceased foreigners leaving no heirs who were natives.

Aliens have been repeatedly the objects of legislation in Britain, and the tendency at the present day is to communicate some of the rights of citizenship to aliens, and to widen the definition of subjects. According to the Act of 1870, now replaced by the British Nationality and Status of Aliens Act, 1914, s. 17, real and personal property of every description may be acquired, held, and disposed of by an alien, in the same manner in all respects as by a natural-born British subject. No other right or privilege (such as the right to hold any office or any municipal, parliamentary, or other franchise) is by this Act conferred on an alien except such as are expressly given in respect of property. Previously aliens could hold only personal property; they were incompetent to hold landed property, except under certain conditions of residence or business occupancy for a term of years not exceeding twenty-one. The children of aliens born in Britain are natural-born subjects.

**Naturalization.** Formerly the only mode of naturalization was by Act of Parliament; but by the Acts of 1914 and 1922 an alien who has resided in the United Kingdom for not less than one year immediately preceding his application, and has previously resided in any part of His Majesty's dominions for four years during the last eight years before the application, or who has been in the service of the Crown for not less than five years, and intends to reside in the kingdom, or to serve the British Crown, may apply to the Secretary of State for a certificate of naturalization, and on giving evidence of particulars may obtain it, being thereby entitled to almost all the political and other rights of a natural-born British subject. It used to be a principle in English law, that a natural-born subject could not divest himself of his allegiance by becoming naturalized in a foreign State (*nemo potest exuere patriam*); but now a British subject who has voluntarily become naturalized in a foreign State thereby ceases to be a British subject. Any British subject who has so become an alien may apply for a certificate of readmission to British nationality on the same terms as those provided for aliens in general.

By the Alien Order, 1920, an alien must obtain permission from an Immigration Officer before he is allowed to land in the United Kingdom. In the United States the position of aliens as regards acquisition and holding of real property differs somewhat in the different States, though in recent times the disabilities of aliens have been removed

in most of them. Personal property they can take, hold, and dispose of like native citizens. Individual States have no jurisdiction on the subject of naturalization, though they may pass laws admitting aliens to any privilege short of citizenship. A naturalized citizen is not eligible for election as president or vice-president of the United States, and cannot serve as senator until after nine years' citizenship, nor as a member of the House of Representatives until after seven years' citizenship.

**ALIEN IMMIGRATION.** In various countries certain classes of aliens have long been prohibited from gaining admission. In the United States, for instance, admission is refused to such persons as idiots, epileptics, persons suffering from loathsome or dangerous contagious diseases, paupers, criminals (except political criminals), illiterate persons, etc. Chinese labourers as a whole are excluded, and even any persons coming to America under a definite agreement to engage in any kind of labour or service. Similar laws are in force in Australia, where there is a test that a person proposing to settle in the country must be able to write fifty words of a European language. Towards the end of last century the great influx of foreigners into Britain, and into London in particular, drew public attention to the matter. A select committee appointed in 1888 reported in favour of the exclusion of destitute aliens, in 1894 a bill was introduced into the House of Lords, while in 1898 a bill to regulate the immigration of aliens was passed in the Lords, but made no further progress. In 1902 a royal commission was appointed, and drew up a report, published in 1903, containing valuable information and various recommendations. Among these were the establishment of an immigration department, and the granting of powers to deport criminals, prostitutes, and other undesirable aliens, and to prevent the landing of persons mentally unfit or suffering from infectious or loathsome diseases.

In 1904 an Aliens Immigration Bill was introduced and read a second time in the House of Commons. It was based on the recommendations of the commission, and in its favour it was argued that a large amount of British labour had been displaced by aliens, in London especially, that the prevalence of crime among aliens was out of proportion to their numbers, that many of them were paupers, criminals convicted in their own country, or other undesirables. In 1905 another bill on the subject was introduced by the Government, which succeeded in passing it, so that the matter can now be dealt with, and undesirable aliens kept out. Since the European War (1914-18) and the new passport regulations, it is easy to ascertain the number of aliens that enter the country and settle.

At the census of 1901 the whole alien population was set down at 286,925, as against 219,523 in 1891, but there has been a very large influx from 1901 to 1914, by far the largest number consisting of Russian and Polish Jews. The restrictions imposed upon aliens during the European War are still in force, so far as they prohibit landing by any alien, except at specified ports by leave of an immigration officer, and, in case of former enemy aliens, by special permission of the Home Secretary. Cf. J. M. Landa, *The Alien Problem.*

**ALIENISM.** A medical term denoting the study and treatment of mental diseases. Alienation is a general term for the various forms of insanity and mental derangement. The physician who specialises in this treatment is called an alienist.

**ALIGANJ** (*a-lē-ganj'*). A town of Bengal, 54 miles from Dinapur, noted for its pottery. It has a trade in grain, indigo-seed, and cotton, and contains two mosques, and a large mud fort. Pop. 7436.

**ALIGARH** (*a-lē-gar'*). A fort and town in India, in the United Provinces, on the East Indian railway, 84 miles south-east of Delhi. The town, properly called Koel or Coel, is distant about 2 miles from the fort, and is connected with it by a beautiful avenue. It is handsome and well situated, and has a trade in cotton, etc. The fort, which had been skilfully strengthened by French engineers in the service of the Mahrattas, was taken by storm after a desperate resistance in 1803 by the British forces under Lord Lake, when the whole district was added to the British possessions. Pop. 67,776. The district has an area of 1946 sq. miles. Pop. 1,200,822.

**ALIGN'MENT** (a-lin'ment). A military term, signifying the act of adjusting to a straight line or in regular straight lines, or the state of being so adjusted.

**AL'IMENT.** Food, a term which includes everything, solid or liquid, serving as nutriment for the bodily system. Aliments are of the most diverse character, but all of them must contain nutritious matter of some kind, which, being extracted by the act of digestion, enters the blood,

and effects by assimilation the repair of the body. Alimentary matter, therefore, must be similar to animal substance, or transmutable into such. All alimentary substances must, therefore, be composed in a greater or less degree of soluble parts, which easily lose their peculiar qualities in the process of digestion, and correspond to the elements of the body. The food of animals consists for the most part of substances containing little oxygen and exhibiting a high degree of chemical combination, in which respects they differ from most substances that serve as sustenance for plants, which are generally highly oxidized and exhibit little chemical combination.

According to the nature of their constituents most of the aliments of animals are divided into nitrogenous (consisting of carbon, hydrogen, and oxygen along with nitrogen, and also of sulphur and phosphorus) and non-nitrogenous (consisting of carbon, hydrogen, and oxygen without nitrogen). Water and salts are usually considered as forming a third group, and, in the widest sense of the word aliment, oxygen alone, which enters the blood in the lungs, forms the fourth. The articles used as food by man do not consist entirely of nutritious substances, but with few exceptions are compounds of various nutritious with indigestible and accordingly innutritious substances. The only nitrogenous aliments are albuminous substances, and these are contained largely in animal food (flesh, eggs, milk, cheese). The principal non-nitrogenous substance obtained as food from animals is fat. Sugar is so obtained in smaller quantities (in milk).

While some vegetable substances also contain much albumen, very many of them are rich in starch. Among vegetable substances the richest in albumen are the legumes (peas, beans, and lentils), and following them come the cereals (wheat, oats, etc.). Sugar, water and salts may pass without any change into the circulatory system; but albuminous substances cannot do so without being first rendered soluble and capable of absorption (in the stomach and intestines); starch must be converted into sugar and fat emulsified (chiefly by the action of the pancreatic juice). One of the objects of cooking is to make our food more susceptible of the operation of the digestive fluids.

The relative importance of the various nutritious substances that are taken into the system and enter the blood depends upon their chemical constitution. The albuminous substances are the most indispensable, inasmuch as they form the material by which the constant waste of the body is repaired, whence they are called by Liebig the substance-formers. But a part of the operation of albuminous nutriments may be performed equally well, and at less cost, by non-nitrogenous substances, that part being the maintenance of the temperature of the body. As is well known, the temperature of warm-blooded animals is considerably higher than the ordinary temperature of the surrounding air, in man about 98° F., and the uniformity of this temperature is maintained by the heat which is set free by the chemical processes (of oxidation) which go on within the body.

Now these processes take place as well with non-nitrogenous as with nitrogenous substances. The former are even preferable to the latter for the keeping up of these processes: by oxidation they yield larger quantities of heat with less labour to the body, and they are hence called the heat-givers. The best heat-giver is fat. Albuminous matters are not only the tissue-formers of the body; they also supply the vehicle for the oxygen, inasmuch as it is of such matters that the blood corpuscles are formed. The more red blood corpuscles an animal possesses, the more oxygen can it take into its system, and the more easily and rapidly can it carry on the process of oxidation and develop heat. Now only a part of the heat so developed passes away into the environment of the animal; another part is transformed within the body (in the muscles) into mechanical work. Hence it follows that the non-nitrogenous articles of food produce not merely heat but also work, but only with the assistance of albuminous matters, which, on the one hand, compose the working machine, and on the other hand, convey the oxygen necessary for oxidation.

The wholesome or unwholesome character of any aliment depends, in a great measure, on the state of the digestive organs in any given case, as also on the method in which it is cooked. Very often a simple aliment is made indigestible by artificial cookery. In any given case the digestive power of the individual is to be considered in order to determine whether a particular aliment is wholesome or not. In general, therefore, we can only say that that aliment is healthy which is easily soluble, and is suited to the power of digestion of the individual. Man is fitted to derive nourishment both from animal and vegetable aliment, but can live

exclusively on either. The nations of the North incline generally more to animal aliments; those of the South, and the Orientals, more to vegetable. The inhabitants of the most northerly regions live almost entirely upon animal food, and very largely on fat, on account of its heat-giving property. *See* DIETETICS, DIGESTION, ADULTERATION, etc.

**ALIMENTARY CANAL.** A common name given to the œsophagus, stomach, and intestines of animals. *See* ŒSOPHAGUS, INTESTINE, STOMACH.

**ALI-MIRZA.** Shah of Persia, son of Muzaffared-Din, born in 1872. He succeeded his father on 8th Jan., 1907. Although his European education had given him sympathies for Western civilization, he showed himself despotic, and became very unpopular. He was deposed by the National Assembly or Mejliss in July, 1909, and his son proclaimed Shah in his place.

**AL'IMONY** (Lat. *alere*, to nourish). In law, the allowance to which a woman is entitled while a matrimonial suit is pending between her and her husband, or after a legal separation from her husband, not occasioned by adultery or elopement on her part. It is either temporary or permanent, the former being the provision made by the husband pending the suit, the latter after the decree.

**ALINGTON, Cyril Argentine.** English headmaster. The son of a clergyman, he was born in 1872, and in 1916 was chosen headmaster of Eton. He wrote a detective story, *Mr. Evans*, as well as *Eton Fables*, 1921; *Doubts and Difficulties*, 1929, and other books. In 1933 he was appointed to succeed Dr. Welldon as Dean of Durham.

**AL'IQUOT PART.** Such part of a number as will divide and measure it exactly without any remainder. For instance, 2 is an aliquot part of 4, 3 of 12, and 4 of 20.

**ALISMA'CEÆ.** The water-plantain family, a natural order of endogenous plants, the members of which are herbaceous, annual or perennial; with petiolate leaves sheathing at the base, hermaphrodite (rarely unisexual) flowers, disposed in spikes, panicles, or racemes. They are floating or marsh plants, and many have edible fleshy rhizomes. They are found in all countries, but especially in Europe and North America, where their rather brilliant flowers adorn the pools and streams. The principal genera are *Alisma* (water-plantain), *Sagittaria* (arrow-head), *Damasonium* (star-fruit), and *Butomus* (flowering-rush).

**AL'ISON, Rev. Archibald.** A theologian and writer on æsthetics, born at Edinburgh in 1757; died there in 1839. He studied at Glasgow and at Balliol College, Oxford, entered the English Church, and finally (1800) settled as the minister of an Episcopal chapel at Edinburgh. He published 2 volumes of sermons and a work entitled *Essays on the Nature and Principles of Taste* (1790), in which he maintains that all the beauty of material objects depends upon the associations connected with them.

**AL'ISON, Sir Archibald.** Lawyer and writer of history, son of the above, was born in Shropshire in 1792, and died in 1867, near Glasgow. He was educated at the University of Edinburgh, and in 1814 was admitted to the Scottish bar. He spent his vacations in travelling on the Continent. In 1822 he was appointed advocate deputc, which post he held till 1830. In 1832 he published *Principles of the Criminal Law of Scotland*, and in 1833 *The Practice of the Criminal Law*. He was appointed sheriff of Lanarkshire in 1834, and retained this post till his death. He was made a baronet in 1852. His chief work—*The History of Europe, from 1789 to 1815*—was first issued in 10 vols., 1833-42, the narrative being subsequently brought down to 1852, the beginning of the second French Empire. This work displays industry and research, and is generally accurate, but not very readable. It has been translated into French, German, Arabic, Hindustani, etc. Among Sir Archibald's other productions are *Principles of Population*; *Free-trade and Protection*; *England in 1815 and 1849*; *Life of the Duke of Marlborough*, etc.

**AL'ISON, General Sir Archibald, G.C.B.** Son of the above, was born 1826, entered the army in 1846, and served in the Crimea, in India during the mutiny, and in the Ashantee expedition of 1873-4. In Egypt, in 1882, he led the Highland Brigade at the battle of Tel-el-Kebir, and in 1882-3 remained in command of the army of occupation (of 12,000 men). He retired from the army in 1893, and died in 1907.

**ALIWAL'.** A village of India, in the Punjab, on the left bank of the Sutlej, celebrated from the battle fought in its vicinity, 28th Jan., 1846, between the Sikhs and a British army commanded by Sir Harry Smith, resulting in the total defeat of the Sikhs.

**ALIWAL NORTH.** A town in the

eastern part of Cape Province, on the Orange River, which here forms the boundary with the Orange Free State and is crossed by a fine bridge—the Frere Bridge. It stands at the height of 4350 feet, in a locality said to be highly suitable for consumptives, and the warm sulphur springs in the neighbourhood also attract many invalids. It is a well-built place, with churches, hotels, golf links, race-course, etc.; and has railway connection with East London, Port Elizabeth, etc. Pop. 6297.—**Aliwal South** was a name formerly given to Mossel Bay, the small seaport midway between Cape Town and Port Elizabeth.

**ALIZ'ARINE.** A substance contained in the madder root (*Rubia tinctorum*) and largely used in dyeing reds of various shades, as turkey red, etc. Until 1868 it was obtained entirely from madder root, but the use of the root has been almost superseded by the employment of alizarine itself, prepared artificially from one of the constituents of coal-tar. It forms yellowish-red prismatic crystals, nearly insoluble in cold, but dissolved to a small extent by boiling water, and readily soluble in alcohol and ether. It possesses exceedingly strong tinctorial powers.

**AL'KAHEST.** The so-called universal solvent or menstruum of the alchemists. The word is believed to have been invented by Paracelsus.

**AL'KALI** (from Ar. *al-qali*, the ashes of the plant from which soda was first obtained, or the plant itself). A term first used to designate the soluble parts of the ashes of plants, especially of sea-weed, and designated *fixed alkali*, as marking a distinction from ammonia, which was termed *volatile alkali*. Now the term is applied to various classes of bodies having the following properties in common: (1) solubility in water; (2) the power of neutralizing acids, and forming salts with them; (3) the property of corroding animal and vegetable substances; (4) the property of altering the tint of many colouring matters—thus, they turn litmus, reddened by an acid, into blue; turmeric, brown; and syrup of violets and infusion of red cabbages, green.

The alkalies may be regarded as water in which part of the hydrogen is replaced by a metallic radicle. The caustic alkalies are strong alkalies which have a powerful corrosive action on the skin, and the common ones are potassic hydroxide or caustic potash, sodic hydroxide or caustic soda, and lithic hydroxide. **Volatile** alkali, or ammonic hydroxide, is a much feebler alkali than the others, and when the solution is heated all the ammonia is driven off. Other alkalies are calcic hydroxide or slaked lime, a solution of which in water is known as *lime-water*; baric hydroxide and strontic hydroxide, derived from the metals barium and strontium. Quicklime is the only alkali extensively used in agriculture.

**ALKALIM'ETER.** An instrument for ascertaining the quantity of free alkali in any impure specimen, as in the potashes of commerce. These, besides the carbonate of potash, of which they principally consist, usually contain a portion of foreign salts, as sulphate and chloride of potassium, and as the true worth of the substance, or price for which it ought to sell, depends entirely on the quantity of carbonate, it is of importance to be able to measure it accurately by some easy process. This process depends on the neutralization of the alkali by an acid of known strength, the point of neutralization being determined by the fact that neutral liquids are without action on either red or blue litmus solution.

The alkalimeter is merely a graduated tube—a burette—with a stop-cock at the lower extremity, from which the standard acid is dropped into water in which a known weight of the substance is dissolved. The quantity required to produce neutralization being noted, the strength of the liquid tested is easily arrived at. A process of neutralization, exactly the same in principle, may be employed to test the strength of acids by alkalies, the one process being called *alkalimetry* the other *acidimetry*.

**AL'KALOID.** A term applied to a class of nitrogenous compounds having basic properties, found in living plants, usually in combination with organic acids. They are usually given names ending in *-ine*, as *morphine, quinine, aconitine, nicotine, caffeine*, etc. Most alkaloids occur in plants, but some are formed by decomposition. Most natural alkaloids contain carbon, hydrogen, nitrogen and oxygen, but a few contain no oxygen. The nitrogen they contain imparts to them basic properties—they are organic bases—and hence they all form salts with acids. They all possess a pronounced bitter taste, and the poisonous nature of many plants, e.g. hemlock, yew, deadly nightshade, etc., are due to the alkaloids they contain. Although formed originally within the plant, it has been found possible to prepare several of these alkaloids by artificial means.

**AL'KANET.** A dyeing drug, the bark of the root of the *Anchūsa* or *Alkanna tinctoria*, a plant of the order Boraginaceæ, with downy and spear-shaped leaves, and clusters of small purple or reddish flowers. The plant is sometimes cultivated in Britain, chiefly on the east coast of England, but most of the alkanet of commerce is imported from the Levant or from southern France. It imparts a fine deep-red colour to all unctuous substances and is used for colouring oils, plasters, lip-salve, confections, etc.; also in compositions for rubbing and giving colour to mahogany furniture, and to colour spurious port-wine.

**ALKAN'NA.** A name of henna. *See also* ALKANET.

**ALKAR'SIN.** An extremely poisonous liquid containing kakodyle, together with oxidation products of this substance, and formerly known as *Cadet's fuming liquor*, characterized by its insupportable smell and high degree of spontaneous combustibility when exposed to air.

**AL-KATIF.** A town of Arabia, on the Persian Gulf, carrying on a considerable trade. Pop. 6000.

**ALKMAAR** (ălk'mär). A town of the Netherlands, province of North Holland, on the North Holland Canal, and 24½ miles by rail N.N.W. of Amsterdam; regularly built, with a fine church (St. Lawrence) and a richly decorated Gothic town-house; manufactures of salt, sail-cloth, vinegar, leather, etc., and an extensive trade in cattle, corn, butter and cheese. Pop. 28,294.

**AL-KO'RAN,** or **QU'RAN.** *See* KORAN.

**ALLA BREVE** (brā'vā), A musical direction expressing that a breve is to be played as fast as a semibreve, a semibreve as fast as a minim, and so on. It is also called a capella, as it is employed in church music.

**AL'LAH.** In Arabic, the name of God, a word of kindred origin with the Hebrew word *Elohim*. *Alla Akbar* (God is great) is a Mahommedan war-cry.

**ALLAHABĀD'** ("city of Allah"). An ancient city of India, capital of the United Provinces, on the wedge of land formed by the Jumna and the Ganges, largely built of mud houses, though the English quarter has more of a European aspect. Among the remarkable buildings are the fort, occupying the angle between the rivers, and containing the remains of an ancient palace, and now also the barracks, etc.; the mausoleum and garden of Khosru, the tomb being a handsome domed building; the Government offices and courts; Government house; the Roman Catholic cathedral; the Central College for the United Provinces; the Mayo Memorial and town hall.

Allahabad is one of the chief resorts of Hindu pilgrims, who have their sins washed away by bathing in the waters of the sacred rivers Ganges and Jumna at their junction; and is also the scene of a great fair in December and January. There are no manufactures of importance, but a large general and transit trade is carried on. The town is as old as the third century B.C. In the mutiny of 1857 it was the scene of a serious outbreak and massacre. Pop. 183,914. —The division of Allahabad contains the districts of Cawnpur, Futtehpur, Hamirpur, Banda, Jaunpur, and Allahabad; area, 17,265 sq. miles. Pop. 5,535,803.—The district contains an area of 2858 sq. miles, about five-sixths being under cultivation. Pop. 1,487,904.

**ALLAMAN'DA.** A genus of American tropical plants, ord. Apocynaceæ, with large yellow or violet flowers: some of them are grown in European greenhouses. *A. cathartica* has strong emetic and purgative properties.

**ALLAN, David.** A Scottish painter, born 1744, died 1796. He studied in Foulis's academy of painting and engraving in Glasgow, and for sixteen years in Italy; finally establishing himself at Edinburgh, where he succeeded Runciman as master of the Trustees' Academy. His illustrations of the *Gentle Shepherd*, *The Cottar's Saturday Night*, and other sketches of rustic life and manners in Scotland are his best-known works.

**ALLAN, Sir Hugh.** Scottish shipowner, who was born at Saltcoats in 1810. He went to Canada and formed the Montreal Ocean Steamship Co., later called the Allan Line. He was knighted in 1871 and died in 1882. The Allan Line is now owned by the Canadian Pacific Ocean Services, Ltd.

**ALLAN, Sir William.** A distinguished Scottish artist, born in 1782, died in 1850. He was a fellow student with Wilkie in Edinburgh, afterwards a student of the Royal Academy, London. After residing in Russia for ten years, he returned to Scotland, and publicly exhibited his pictures, one of which (*Circassian Captives*) made his reputation.

He now turned his attention to historical painting, and produced *Knox admonishing Mary Queen of Scots*, *Murder of Rizzio*, *Exiles on their way to Siberia*, *The Slave Market*

*at Constantinople*, etc.; and afterwards also battle scenes, as the *Battle of Prestonpans*, *Nelson boarding the San Nicolas*, and two pictures of *The Battle of Waterloo*, the one from the British, the other from the French position, and delineating the actual scene and the incidents therein taking place at the moment chosen for the representation. One of these Waterloo pictures was purchased by the Duke of Wellington. He travelled extensively, visiting Italy, Greece, Asia Minor, Spain and Barbary. In 1835 he became a Royal Academician, in 1838 president of the Scottish Academy, and in 1842 he was knighted.

**ALLAN'TOIS.** A structure appearing during the early development of vertebrate animals—Reptiles, Birds, and Mammalia. It is largely made up of blood-vessels, and, especially in Birds, attains a large size. It forms the inner lining to the shell, and may thus be viewed as the surface by means of which the respiration of the embryo is carried on. In Mammalia the allantois is not so largely developed as in Birds, and it enters largely into the formation of the placenta.

**ALLEGATION.** In English law a statement which has not been proved in a court of law, but which its authors think is true. By using the word alleged, it is possible to avoid actions for libel.

**ALLEGHANY** (al-le-gā'ni). A river of Pennsylvania and New York, which unites with the Monongahela at Pittsburg to form the Ohio; navigable nearly 200 miles above Pittsburg.

**ALLEGHANY MOUNTAINS**, or the **ALLEGHANIES.** A name sometimes used as synonymous with Appalachians, but also often restricted to the portion of those mountains that traverses the states of Virginia, Maryland and Pennsylvania from south-west to north-east, and consists of a series of parallel ridges for the most part wooded to the summit, and with some fertile valleys between. Their mean elevation is about 2500 feet; but in Virginia they rise to 4473.

**ALLEGHENY** (al-le-gen'i). A city of the United States, in Pennsylvania, on the River Allegheny, opposite Pittsburg, of which it may be considered virtually to be a suburb, and with which it is connected by six bridges. The principal industries are connected with iron and machinery. Pop. 132,283. Also called Alleheny City.

**ALLE'GIANCE** (from mid-Eng. *ligeaunce*, formed from *liege*). According to Blackstone, is "the tie or *ligamen* which binds the subject to the sovereign in return for that protection which the sovereign affords the subject," or, generally, the obedience which every subject or citizen owes to the Government of his country. It used to be the doctrine of the English law that natural-born subjects owe an allegiance which is intrinsic and perpetual, and which cannot be divested by any act of their own (*Nemo potest exuere patriam*); but this is no longer the case since the Naturalization Act passed in 1870. A British subject, however, or a child who has acquired a British domicile by the naturalization of an alien parent, cannot in time of war divest himself of British nationality for the purpose of becoming an enemy alien. Aliens owe a temporary or local allegiance to the Government under which they for the time reside. Usurpers in undisturbed possession of the Crown are entitled to allegiance; and thus treasons against Henry VI. were punished in the reign of Edward IV., though the former had, by Act of Parliament, been declared a usurper.

**AL'LEGORY.** A figurative representation in which the signs (words or forms) signify something besides their literal or direct meaning. In rhetoric, allegory is often but a continued simile. Parables and fables are a species of allegory. Sometimes long works are throughout allegorical, as Spenser's *Faerie Queene* and Bunyan's *Pilgrim's Progress*. When an allegory is thus continued it is indispensable to its success that not only the allegorical meaning should be appropriate but that the story should have an interest of its own in the direct meaning apart from the allegorical significance. Allegories are frequent in the Old Testament, whilst in the New they take the form of parables. One of the best-known allegories in classical literature is the story of the stomach and the members of the body in the speech attributed to Menenius Agrippa by Plutarch and Livy. (Cf. Shakespeare, *Coriolanus* i. 1.) Allegory is often made use of in painting and sculpture as well as in literature.

**ALLEGRI** (àl-lā'grē), **Gregorio.** An Italian composer, born at Rome in 1560 or 1585, died there about 1650; celebrated for his *Miserere*, a setting of the fifty-first psalm (the fiftieth in the *Vulgate*), which in the Latin version begins with that word. Allegri's *Miserere* is annually performed in the Sistine Chapel at Rome.

**ALLEGRO** (It. àl-lā'grō). A musical term expressing a more or less

quick rate of movement, or a piece of music or movement in lively time. *Allegro moderato*, moderately quick; *allegro maestoso*, quick but with dignity; *allegro assai* and *allegro molto*, very quick; *allegro con brio* or *con fuoco*, with fire and energy; *allegrissimo*, with the utmost rapidity.

**ALLEIN** (al'en), **Joseph.** English Nonconformist divine; born 1633, died 1668; the author of a popular religious book entitled, *An Alarm to Unconverted Sinners, or The Sure Guide to Heaven* (1672).

**ALLEIN** (al'en), **Richard.** English Nonconformist divine; born in 1611, died 1681; rector for twenty years of Batcombe (Somerset); deprived of his living at the Restoration, and imprisoned for preaching. He wrote, among other things, *Vindiciæ Pietatis* ("A Vindication of Godliness"), published in 1660, which was condemned to be burned in the royal kitchen.

**ALLELUIA.** *See* HALLELUIA.

**ALLEMANDE** (àl-mànd). A kind of slow, graceful dance, invented in France in the time of Louis XIV., and again in vogue in the time of the First Empire. The name is also given to pieces of music based on the dance movement. Bach and Handel have composed a great number of Allemandes, and Beethoven has written twelve for orchestra.

**ALLEN, Bog of.** The name applied to a series of bogs in Ireland (not to one continuous morass), dispersed, often widely apart, with extensive tracts of dry cultivated soil between, over a broad belt of land stretching across the centre of the country, the bogs being, however, all on the east side of the Shannon. Lough Allen is one of the lakes formed by the Shannon. It is 5 miles long and covers about 15 sq. miles in the counties of Roscommon and Leitrim.

**ALLEN, Ethan.** An American revolutionary partisan and general; born 1737, died 1789. He surprised and captured Ticonderoga Fort (1775); attacked Montreal, and was captured and sent to England, being exchanged in 1778; wrote against Christianity, *Reason, the only Oracle of Man* (1784).—His younger brother, Ira (1751-1814), was also prominent in the revolutionary era.

**ALLEN, Grant.** Writer on scientific subjects and novelist, was born at Kingston, Canada, 1848, died in 1899. His earlier education he received in America, but he also studied in France and graduated at Oxford with honours in 1870. From 1873 to 1879 he was connected with Queen's College, Jamaica, but afterwards resided chiefly in England, and became well known as an exponent of evolutionary science, and as a novelist. His first important work, *Physiological Æsthetics*, appeared in 1877; his other scientific or semi-scientific works include *The Colour Sense*; *The Evolutionist at Large*; *Colin Clout's Calendar* (*the record of a summer*); *Vignettes from Nature*; *The Colours of Flowers*; *Flowers and their Pedigrees*; and *Force and Energy, a Theory of Dynamics*. Other works by him are: *Anglo-Saxon Britain*; *Charles Darwin*; and *The Evolution of the Idea of God*. His novels, about thirty in number, include: *The Devil's Die*; *The Woman Who Did*, etc.

**ALLEN, John.** A Scottish political and historical writer; born in 1771, died in 1843. He studied medicine and became M.D. of Edinburgh University. In 1801 he went abroad with Lord Holland and family, and henceforth he maintained this connection, being long an inmate of Holland House (London) and a member of the brilliant society that assembled there. He contributed many articles to the *Edinburgh Review*; and wrote *An Inquiry into the Rise and Growth of the Royal Prerogative in England*; *Vindication of the Ancient Independence of Scotland*; etc.

**ALLEN, Ralph.** Celebrated as a philanthropist, and as the friend of Pope, Fielding, and the elder Pitt, was born in 1694, died in 1764. He lived mostly at Bath, where he made a large income as farmer of a system of posts and as owner of quarries. He is the prototype of Squire Allworthy in Fielding's *Tom Jones*; and after the novelist's death he took charge of his family. Pope, who received many kindnesses at his hands, referred to him in the lines:

> Let humble Allen, with an awkward shame,
> Do good by stealth, and blush to find it fame.

With Pitt he was on intimate terms, and left him £1000 in his will. Hurd, Sherlock, and Warburton were also his friends.

**ALLEN, Thomas.** An English mathematician, philosopher, antiquarian and astrologer, born in 1542, died in 1632. He studied at Oxford, and lived the greater part of his life in learned retirement, corresponding with many of the famous men of his time. In his own day he was generally reputed a dealer in the black art.

**ALLEN, William, Cardinal.** An English Roman Catholic of the time of Queen Elizabeth. Influenced by the Jesuit Robert Parsons, he be-

came a strenuous opponent of Protestantism and supporter of the claims of Philip II. to the English throne; born 1532, died 1594. It was by his efforts that the English college for Catholics at Douai was established. He was made cardinal in 1587. His numerous writings include: *The Declaration of the Sentence of Sixtus V.*, and *An Admonition to the Nobility and People of England.*

**ALLEN, William, D.D.** American clergyman and author; born 1784, died 1868. He was president of Bowdoin College, 1820-39; author of *American Biographical and Historical Dictionary*; *Junius Unmasked*; etc.

**ALLENBY, Viscount, Edmund Henry Hynman.** British field-marshal, 1st Viscount, G.C.B., G.C.M.G., was born in 1861. He joined the Inniskilling Dragoons, and in 1884 served with that regiment in the Bechuanaland Expedition. He was with the British forces in Zululand in 1888, took part in the South African war, and commanded the 4th Cavalry Brigade, 1905-10. In the European War he at first commanded the British Third Army, contributing largely to the victories of the Somme and the Aisne. After a reverse, south of Gaza, suffered on 26th March, 1917, by the British troops under the command of Sir Archibald Murray, the latter was relieved and General Allenby was placed in command of the operations. He made thorough preparations for the next offensive, and his progress was very rapid. Beersheba and Gaza were captured, and on 9th Dec., 1917, Jerusalem, the Holy City, was surrendered to the general by the mayor. His formal entry took place on the 11th. He was awarded the G.C.M.G. on 16th Dec., 1917, and is a Grand Officer of the Legion of Honour. In Aug., 1919, he was voted a sum of £50,000 and created a viscount, adopting the title of Viscount Allenby of Megiddo and of Felixstowe in Suffolk. From 1919-25 he was High Commissioner for Egypt.

**ALLENDALE.** Village in Northumberland. It is 13 miles from Hexham and is a centre for tourists visiting the district. Pop. 3012.

**ALLENSTEIN** (al'len-stīn). A town in East Prussia, 65 miles south of Königsberg, on the Alle, with breweries and manufactures of iron and lucifer matches. Pop. 38,015.

**ALLENTOWN.** A town in the United States, Pennsylvania, on Lehigh River, 18 miles above its junction with the Delaware. It has an important trade in coal and iron ore, with large blast-furnaces, rolling-mills, etc. Pop. 92,563.

**ALLEP'PEY.** *See* ALAPOLAY.

**ALLEYN** (al'len), **Edward.** An actor and theatre proprietor in the reigns of Elizabeth and James I., friend of Ben Jonson and Shakespeare; born 1566, died 1626. Nashe called him "the famous Ned." Having become wealthy, he built Dulwich College, under the name of "The College of God's Gift," between 1613-17, at a cost of £10,000. *See* DULWICH.

**ALL-FOURS.** A game at cards, which derives its name from the four chances of which it consists, for each of which a point is scored. These chances are *high*, or the ace of trumps, or next best trump out; *low*, or the deuce of trumps, or next lowest trump out; *jack*, or the knave of trumps; *game*, the majority of pips collected from the tricks taken by the respective players. The player who has all these is said to have *all-fours*. It is played by two or four persons with the full pack. The ace counts four, the king three, queen two, knave one, ten ten. The game is known in America as *Seven-up*, *Old-sledge*, or *High-low Jack*.

**ALL-HALLOWS,** or **ALL-HALLOWMAS.** A name for All-saints' Day.

**ALL HALLOWS.** Seaside resort of Kent. It is on the estuary of the Thames, 33 miles from London, opposite Southend. There is a station on the Southern Rly., which opened the place in 1932 as a pleasure resort.

**AL'LIA.** A small affluent of the Tiber, joining it about 11 miles from Rome, famous for the victory won by the Gauls, under Brennus, over the Roman army. This battle resulted in the capture and sack of Rome in 390 B.C.

**ALLIA'CEOUS PLANTS.** Plants belonging to the genus Allium (ord. Liliaceæ), that to which the onion, leek, garlic, shallot, etc., belong, or to other allied genera, and distinguished by a certain peculiar pungent smell and taste characterized as *alliaceous*. This flavour is also found in a few plants having no botanical affinities with the above, as in the *Alliaria officinālis*, or Jack-by-the-hedge, a plant of the order Cruciferæ.

**ALLI'ANCE.** A league between two or more Powers. Alliances are divided into offensive and defensive. The former are for the purpose of attacking a common enemy, and the latter for mutual defence. An al-

liance often unites both of these conditions. Offensive alliances, of course, are usually directed against some particular enemy; defensive alliances against any one from whom an attack may come. Among the more famous alliances in history are: The Triple Alliance of 1688 between Great Britain, Sweden and the Netherlands; The Grand Alliance of 1689 between the Emperor, Holland, England, Spain and Saxony; The Quadruple Alliance of 1814 between Great Britain, Austria, Russia and Prussia; The Triple Alliance of 1882 between Germany, Austria and Italy; and The Dual Alliance between Russia and France.

The Triple Entente, embracing Great Britain, France, and Russia, was concluded in 1907. It was broken in 1918 when Russia was controlled by the Bolsheviks who concluded a separate peace with the Central Powers.

The Locarno Treaties (1925) to some extent constitute an alliance. (*See* LOCARNO).

**ALLIANCE, Holy.** *See* HOLY ALLIANCE.

**ALLIANCE ISRAÉLITE UNIVERSELLE.** An association founded in Paris in 1860 for the protection of the Jews all over the world, but particularly with a view to advocating by various means the emancipation of the Jews in those countries where they did not enjoy equal civil and political rights with the other inhabitants. It was established by six Jews of Paris: Aristide Astruc, Isidore Cahen, Jules Carvallo, Narcisse Leven, Eugéne Manuel and Charles Netter. Adolphe Crémieux and Salomon Munk were among the first presidents of the association. It is managed by a central committee resident in Paris and consisting of 62 members, 23 of whom live in Paris.

The Alliance has done a great deal towards raising the status of the Jews in the East by establishing educational institutions and industrial and agricultural schools, especially in Turkey, Egypt, Morocco, Persia, Bulgaria, Tunis and Abyssinia. The chief sources of its income are the subscriptions and donations of the members. Its annual income amounts to about 200,000 francs. It also manages a fund of about £400,000 founded by Baron and Baroness de Hirsch for the establishment of Jewish Schools in Turkey. The Alliance Israélite works in unison with the Anglo-Jewish Association and the Board of Deputies in London, two organizations pursuing the same aims.

**ALLIA'RIA.** A genus of plants, ord. Cruciferæ, containing two species one of which (*A. officinālis*), commonly called Jack-by-the-hedge, is widely spread in Europe, and often used as a pot-herb. *See* ALLIACEOUS PLANTS.

**AL'LIBONE, Samuel Austin, LL.D.** American author, born 1816, died 1889. He compiled a most useful *Critical Dictionary of English Literature and British and American Authors* (3 vols., 1859, 1870, 1871, containing 50,000 biographies, 2 vols. of supplement by J. F. Kirk, 1891).

**ALLICE.** A name of the common shad.

**ALLIER** (ăl-lĕ-ā). A central department of France, intersected by the River Allier, and partly bounded by the Loire; its surface is diversified by offsets of the Cevennes and other ranges, rising in the south to over 4000 feet, and in general richly wooded. It has extensive beds of coal as well as other minerals, which are actively worked, there being several flourishing centres of mining and manufacturing enterprise; mineral waters at Vichy, Bourbon, L'Archambault, etc. Large numbers of sheep and cattle are bred. Area 2848 sq. miles. Capital, Moulins. Pop. 373,924.—The River Allier flows northward for 200 miles through Lozère, Upper Loire, Puy de Dôme, and Allier, and enters the Loire, of which it is the chief tributary.

**ALLIGA'TION.** A rule of arithmetic, chiefly found in the older books, relating to the solution of questions concerning the compounding or mixing together of different ingredients, or ingredients of different qualities or values. Thus if a quantity of tea worth 10*d.* the pound and another quantity worth 18*d.* are mixed, the question to be solved by alligation is, what is the value of the mixture by the pound?

**ALLIGA'TOR** (a corruption of Sp. *el lagarto*, lit. the lizard — Lat. *lacertus*). A genus of reptiles of the family Crocodilidæ, differing from the true crocodiles in having a shorter and flatter head, in having cavities or pits in the upper jaw, into which the long canine teeth of the under jaw fit, and in having the feet much less webbed. Their habits are less perfectly aquatic. They are confined to the warmer parts of America, where they frequent swamps and marshes, and may be seen basking on the dry ground during the day in the heat of the sun. They are most active during the night, when they make a loud bellowing. The largest of these animals grow to the length of 18

or 20 feet. They are covered by a dense armour of horny scales, impenetrable to a bullet, and have a large mouth, armed with strong, conical teeth. They swim with wonderful celerity, impelled by their long, laterally-compressed and powerful tails.

On land their motions are proportionally slow and embarrassed because of the length and unwieldiness of their bodies and the shortness of their limbs. They live on fish, and any small animals or carrion, and sometimes catch pigs on the shore, or dogs which are swimming. They even sometimes make man their prey. In winter they burrow in the mud of swamps and marshes, lying torpid till the warm weather. The

Alligators—1, Mississippi Alligator; 2, Banded Cayman; 3, Chinese Alligator

female lays a great number of eggs, which are deposited in the sand or mud, and left to be hatched by the heat of the sun, but after this has taken place the mother alligator is very attentive to her young. The most fierce and dangerous species is that found in the southern parts of the United States (*Alligator Lucius*), having the snout a little turned up, slightly resembling that of the pike. The alligators of South America are there very often called *Caymans*. *A. sclerops* is known also as the *Spectacled Cayman*, from the prominent bony rim surrounding the orbit of each eye.

The flesh of the alligator is sometimes eaten, the tail being considered a great delicacy by the negroes. Among the fossils of the south of England are remains of a true alligator (*A. Hantoniensis*) in the Eocene beds of the Hampshire basin.

**ALLIGATOR-APPLE** (*Anona palustris*). A fruit allied to the custard-apple, growing in marshy districts in Jamaica, little eaten on account of its narcotic properties.

**ALLIGATOR-PEAR** (*Persea gratissima*). An evergreen tree of the nat. ord. Lauraceæ, with a fruit resembling a large pear, 1 to 2 lb. in weight, with a firm marrow-like pulp of a delicate flavour; called also avocado-pear, or subaltern's butter. It is a native of tropical America and the West Indies.

**AL'LINGHAM, William.** An Irish poet, born in Ireland in 1824 or 1828, died in 1889. He published his first volume (*Poems*) in 1850; *Day and Night Songs* in 1855; *Lawrence Bloomfield in Ireland*, narrative poem, in 1864; *Songs, Poems, and Ballads* in 1877 (including a number of new poems). He was a frequent contributor to periodicals, and for some time edited *Fraser's Magazine*.

**ALLINGTON.** Village of Kent. It stands on the Medway and is famous for its castle, which is one of the finest in the country.

**ALLITERA'TION.** The repetition of the same letter at the beginning of two or more words immediately succeeding each other, or at short intervals; as "*m*any *m*en *m*any *m*inds"; "*d*eath defies the *d*octor." "*A*pt *a*lliteration's *a*rtful *a*id" (*Churchill*). "*P*uffs, *p*owders, *p*atches, *b*ibles, *b*illet-doux" (*Pope*). "*W*eave, the *w*arp and *w*eave the *w*oof (*Gray*). In the ancient German and Scandinavian and in early English poetry alliteration took the

place of terminal rhymes, the alliterative syllables being made to recur with a certain regularity in the same position in successive verses. In the *Vision of William Concerning Piers the Ploughman*, for instance, it is regularly employed as in the following lines :—

> Hire robe was ful riche · of red scarlet engreyned,
> With ribanes of red gold · and of riche stones ;
> Hire arraye me ravysshed · such richesse saw I nevere ;
> I had wondre what she was : and whas wyf she were.

Alliteration was known to the Latin authors : " O *T*ite *t*ute, *T*ati, *t*ibi, *t*anta, tyranne *t*ulisti " (*Ennius*). In the hands of some English poets and prose writers of later times alliteration became a mere conceit. It is still employed in Icelandic and Finnish poetry. So far has alliteration sometimes been carried that long compositions have been written, every word of which commenced with the same letter. It may also be employed in the middle of words : " Un *f*rais par*f*um sortait des tou*ff*es d'as*f*odile " (*Victor Hugo*).

**AL'LIUM.** A genus of plants, ord. Liliaceæ, containing numerous well-known species of pot-herbs. They are umbelliferous, and mostly perennial, herbaceous plants, but a few are biennial. Among them are garlic (*A. Sativum*), onion (*A. Cepa*), leek (*A. Porrum*), chives (*A. Schœnoprăsum*), shallot (*A. ascalonĭcum*). The peculiar alliaceous flavour that belongs to them is well-known.

**AL'LOA.** A river port of Scotland, on the north bank of the Forth (where there is now a bridge), 7¼ miles from Stirling, county of Clackmannan. It carries on brewing, distilling and shipbuilding ; has manufactures of woollens, bottles, etc., and a shipping trade. Pop. (1931), 13,322.

**ALLOCU'TION.** An address, a term particularly applied to certain addresses on important occasions made by the Pope to the cardinals, and through them to the Church in general.

**ALLO'DIUM** (probably derived from *all* and *odh*, property). Land held in one's own right, without any feudal obligation to a superior or lord. In England, according to the theory of the British constitution, all land is held of the crown (by *feudal* tenure) ; the word *allodial* is, therefore, never applied to landed property there.

**ALLOGAMY** (from the Gr. *allos*, other, and *gamos*, wedding). Meaning the transfer of the pollen of one flower to the pistil of another. The opposite of allogamy is *autogamy*, or self-pollination.

**ALLOPATHY.** Medical term, the exact opposite of homœopathy. The Greek meaning of the word is " other feeling." Allopathy is a way of treating disease by using remedies producing results opposite to those produced by the disease itself.

**ALLOPHANE.** A hydrous aluminium silicate, with the composition $Al_2Si\,O_4+5H_2O$, forming crusts in the cavities of various rocks and commonly of a delicate blue colour.

**ALLOT'MENT SYSTEM.** The system of allotting small portions of land (an acre or less) to farm-labourers or other workers, to be cultivated after their regular work by themselves and their families, a system believed by many to be calculated greatly to improve their condition. An Allotment Act for England, passed in 1887, authorizes the sanitary authorities in any locality to determine if there is a sufficient demand for allotments there, and to acquire land to be let to the labouring population resident in their district. Such land may be compulsorily acquired, due compensation being given ; but land belonging to a park, pleasure-ground, etc., is not to be so acquired. No person is to hold more than 1 acre as an allotment ; and the rents are to be fixed at such amount as may reasonably be deemed sufficient to guarantee the sanitary authority from loss. No building is to be erected on any allotment other than a tool-house, pig-sty, shed, or the like.

In the Allotment Acts of 1887 and 1892 (Scotland) the definition is applied to a plot of land not exceeding 1 acre, but the Local Government Act of 1894 authorized the letting of an allotment up to the area of 4 acres to one person, while the Small Holdings and Allotments Act of 1907 definitely extends the limit of an allotment to 5 acres. The distinction between allotments and small holdings has therefore been obliterated, at least as far as England and Wales are concerned. County councils will let plots of 1 to 5 acres as small holdings, and parish councils as allotments. During the European War 183,000 allotments were registered under the Cultivation of Lands Order, and the number of allotments in Great Britain not exceeding 1 acre now amounts to over 1,000,000. In proportion to the total agricultural area or population it is much smaller in Scotland than in England. In May, 1930, there were 965,000 allotments in England and Wales. The rents of allotments vary greatly, and near towns, or even villages, they are very high, often from £4 to £8 per acre. A measure corresponding to the English Small

Holdings and Allotments Act of 1907 was passed for Scotland in 1911, and came into operation in 1912. In recent years a large number of co-operative allotment associations have come into existence.

**ALLOT'ROPY** (Gr. *allos*, other, *tropos*, manner). A term used by Berzelius to express the fact that one and the same element may exist in different forms, differing widely in external physical properties. Thus carbon occurs as the diamond, and as charcoal and plumbago, and is therefore regarded as a substance subject to allotropy.

**AL'LOWAY.** A parish of Scotland, now included in Ayr parish. Here Burns was born in 1759, and the "auld haunted kirk," near his birthplace, was the scene of the dance of witches in *Tam o' Shanter*.

**ALLOY'.** The substance produced by melting together two or more metals. Sometimes a chemical compound is formed, but more generally one metal is interspersed throughout the other, much as sugar is through water in which it is dissolved. In this case the alloy is called a "solid solution" of one metal in another. Many metals mix together in all proportions, others only in certain proportions, while some will not mix in any proportion.

Scientific research has led to great advances in the use of alloys industrially. An alloy differs from its components in most of its physical properties, such as its hardness, ductility, strength, melting-point, and colour. The minutest trace of certain metals frequently produces an extraordinary change in the property of the body with which it is mixed. For instance, if bismuth is present in copper to the extent of more than 0.5 per cent, the copper cannot be used successfully in the construction of electrical machinery. Frequently the addition of a small proportion of a metal produces highly-desirable effects in one direction, but is deleterious in other directions. For instance, the presence of a small amount of manganese in cast iron gives clean castings, but the magnetic qualities of the material are impaired.

Alloys are classified as ferrous and non-ferrous alloys.

**Ferrous Alloys.** These alloys are of great industrial importance, as they include cast irons and steels. Pure iron is very little used in industry. Ordinary *cast iron* contains iron and about 3 per cent. of carbon. The ordinary wrought iron of the blacksmith contains less than 0.25 per cent of carbon. Cast iron is brittle, and unreliable when used to sustain tensile stresses, and it cannot be forged; but wrought iron can be safely used in tension, is not brittle, and can be forged. The raw material from which steel is made is cast iron or wrought iron. (For manufacture of steel, *see* STEEL.) The properties of steel can be varied within very wide limits by adding to it traces of certain metals. For instance, the addition of nickel up to 5 per cent makes the steel much stronger and tougher; the addition of tungsten up to about 19 per cent makes it hard (tool-steel, magnet-steel), while molybdenum has a similar effect. Chromium and vanadium have a "stabilizing" effect, i.e. tend to make large masses of the alloy homogeneous, and to make the alloy retain its hardness over wide ranges of temperature. Cobalt has a similar stabilizing effect. Molybdenum high-speed steel is more expensive than tungsten high-speed steel, but is said to wear better.

**Non-ferrous Alloys.** Of the non-ferrous alloys the most important have copper as the basic metal. They do not become rusty on exposure. Copper, when used for electrical purposes, must be nearly pure. It is deposited electrolytically (*see* ELECTROLYSIS) and then made into bars (electrolytic copper).

*Brass* is an alloy of copper and zinc and varies much in composition. The best-known varieties are :—

| | |
|---|---|
| Best brass | Copper 70%, Zinc 30%. |
| Admiralty brass | Copper 70%, Zinc 29%, Tin 1%. |
| Ordinary brass | Copper 67%, Zinc 30%, Lead 3%. |

*Gun-metal* is a mixture of copper, tin, and zinc. The standard Admiralty mixture is copper 88, tin 10, zinc 2. It possesses a tensile strength of 14 tons per sq. inch.

*Bronzes.* The bronzes are alloys of copper, with zinc or tin mainly. They can be cast easily, and when heated to a dull red the metal can be forged, stamped, rolled, pressed, or extruded. They are largely free from corrosion.

*Phosphor Bronze.* This is a specially strong bronze. A typical composition is copper 89.5, tin 10, phosphorus 0.5. The tensile strength is higher than that of pure copper or brass (about 15 tons per sq. inch), and it has about one-half the electrical conductivity of pure copper. It is used for small castings, and it can be drawn into wire, which is used in alternating-current electric-railway construction for the overhead conductor.

*Delta metals* are bronzes of specially high tensile strength (30-50 tons per sq. inch).

*Manganese bronzes* are bronzes of high tensile strength and ductility, and are largely used for marine pro-

pellers. Manganese bronze is not affected by sea-water. It usually contains copper, zinc, and manganese, with a little aluminium and tin.

A recently-discovered copper alloy is known as *monel metal*. It is a naturally-occurring alloy of copper, nickel, iron, and manganese (copper 27-29 per cent, nickel 68-70 per cent, iron and manganese 4-5 per cent), and possesses, roughly, the qualities of a mild steel and copper, with high tensile strength.

*Elektron*, an alloy of magnesium with aluminium, manganese, zinc and silicon, discovered in 1930, has a specific gravity of 1.8, and strength greatly superior to that of pure aluminium.

In the British silver coinage silver is alloyed with 7.5 per cent copper, which renders it harder and more durable. British gold coinage contains 8.3 per cent of copper.—BIBLIOGRAPHY: Law, *Alloys*; Osmond and Stead, *Microscopic Analysis of Metals*; Mellor, *Crystallization of Iron and Steel*; Desch, *Metallography*.

**ALL SAINTS' DAY.** A festival of the Christian Church, instituted in 835, and celebrated on 1st Nov., in honour of the saints in general.

**ALLSOPP.** English family. The founder of this family of brewers was Samuel Allsopp, who started a brewery business at Burton-on-Trent. His son, Henry, developed it, and was made a peer in 1886, taking the title of Baron Hindlip. He died April 3, 1887.

**ALL SOULS' COLLEGE.** A college of Oxford University, founded in 1437 by Henry Chichele, Archbishop of Canterbury. Attached to it are the Chichele Professorship of International Law and the Chichele Professorship of Modern History.

**ALL SOULS' DAY.** A festival of the Roman Catholic Church, instituted in 998, and observed on 2nd Nov., for the relief of souls in purgatory.

**ALLSPICE** (ąl'spīs), or **PIMENTA.** The dried and ground berry of a West Indian species of myrtle (*Myrtus Pimenta*), a beautiful tree with white and fragrant aromatic flowers and leaves of a deep shining green. The tree is often 30 feet high, and may yield 150 lb. of raw berries, equivalent to 100 lb. of dried spice. Pimenta is thought to resemble in flavour a mixture of cinnamon, nutmegs, and cloves, whence the popular name of *allspice*; it is also called Jamaica pepper, the trees being cultivated there extensively. It is employed in cookery, also in medicine as an agreeable aromatic, and forms the basis of a distilled water, a spirit, and an essential oil.

Allspice.

**ALL'STON** (ăl'stun), Washington. An American painter, born 1779, died 1843. He studied in London and Rome, and is most celebrated for his pictures on scriptural subjects. Among his pictures *The Angel Uriel* is at Stafford House; *The Prophet Jeremiah* at Yale College, Newport. A portrait of Coleridge by Allston is in the National Gallery. He also wrote poems and a tragical romance (*Monaldi*).

**ALLUVION.** Word used for land added by the action of the sea, or a river. It is usually due to the action of the sea which recedes in one place and encroaches in another, or to the action of a river in changing its course. There are many instances of alluvion in England, one being the estuary of the Ribble.

Alluvion is sometimes confused with alluvium which is the deposit brought down by a river. It is usually the debris of rocks.

**ALLU'VIUM** (Lat. *alluvium—ad*, to, and *luo*, to wash). Deposits of soil collected by the action of water, such as are found in valleys and plains, consisting of loam, clay, gravel, etc., washed down from the higher grounds. Great alterations are often produced by alluvium—deltas and whole islands being often formed by this cause. Much of the rich land along the banks of rivers is alluvial in its origin. There are great tracts of alluviums lying along the banks of the Derwent, the Ouse, and the Trent, and the Romney Marsh of Kent along the banks of the Thames.

**ALLYGURH.** *See* ALIGARH.

**ALMA.** A small river of Russia, in the Crimea, celebrated from the victory gained by the allied British and French over the Russians, 20th Sept., 1854.

**AL'MACK'S.** The name formerly given to certain assembly-rooms in King Street, St. James's, London, derived from Almack, a taverner-keeper, by whom they were built, and whose real name is said to have been M'Call, of which Almack is an anagram; afterwards called *Willis's Rooms*. They were first opened about 1770, and became famous for the extreme exclusiveness displayed by the lady patronesses in regard to the admission of applicants for tickets to the balls held here—only those of the most assured social standing being admitted. They were turned into a restaurant in 1890.

**ALMA'DA.** A town of Portugal, on the Tagus, opposite Lisbon. Pop. 11,580.

**AL'MADEN.** A place in California, United States, about 60 miles S.E. of San Francisco, with rich quicksilver mines, the product of which has been largely employed in gold and silver mining.

**ALMADEN'.** A town of Spain, province of Ciudad-Real, celebrated both in ancient and modern times for its mines of quicksilver (in the form of cinnabar). Pop. 10,000.

**ALMADEN PROCESS.** *See* MERCURY.

**AL'MAGEST** (Ar. *al*, the, and Gr. *megistē*, greatest, *sc.* "treatise"). The name of a celebrated astronomical work composed by Claudius Ptolemy.

**ALMA'GRO.** An old town of Spain, province of Ciudad-Real (New Castile) with important lace manufactures. Pop. 8700.

**ALMA'GRO, Diego de.** Spanish "Conquistador," a foundling, born in 1475, killed 1538. He took part with Pizarro in the conquest of Peru, and after frequent disputes with Pizarro about their respective shares in their conquests led an expedition against Chile, which he failed to conquer. On his return a struggle took place between him and Pizarro, in which Almagro was finally overcome, taken prisoner, strangled, and afterwards beheaded. He was avenged by his son, born in 1520, who raised an insurrection, in which Pizarro was assassinated in 1541. The younger Almagro was put to death at Cuzco in 1542 by De Castro, the new Viceroy of Peru.

**ALMALEE'**, or **ELMALI.** A town of Asia Minor, 50 miles from Adalia, with thriving manufactures and a considerable trade. Pop. about 20,000.

**AL'MA MA'TER** (Lat., fostering or bounteous mother). A term familiarly applied to their own university by those who have had a university education.

**AL MAMUN** (mä-mön'). A caliph of the Abasside dynasty, son of Harun-al-Rashid, born 786, died 833. Under him Bagdad became a great centre of art and science.

**AL'MANAC.** A calendar, in which are set down the rising and setting of the sun, the phases of the moon, the most remarkable positions and phenomena of the heavenly bodies, for every month and day of the year; also the several fasts and feasts to be observed in the Church and State, etc., and often much miscellaneous information likely to be useful to the public.

**History.** The term is of Arabic origin, but the Arabs were not the first to use almanacs, which indeed existed from remote ages. In England they are known from the fourteenth century, there being several English almanacs of this century existing in MS. They became generally used in Europe within a short time after the invention of printing; and they were very early remarkable, as some are still, for the mixture of truth and falsehood which they contained. Their effects in France were found so mischievous, from the pretended prophecies which they published, that an edict was promulgated by Henry III. in 1579 forbidding any predictions to be inserted in them relating to civil affairs, whether those of the State or of private persons. In the reign of James I. of England letters-patent were granted to the two universities and the Stationers' Company for an exclusive right of printing almanacs, but in 1775 this monopoly was abolished. During the civil war of Charles I., and thence onward, English almanacs were conspicuous for the unblushing boldness of their astrological predictions, and their determined perpetuation of popular errors.

**Famous almanacs.** The most famous English almanac was *Poor Robin's Almanack*, which was published from 1663 to 1775. Gradually, however, a better taste began to prevail, and in 1828 the Society for the Diffusion of Useful Knowledge, by publishing the *British Almanac*, had the merit of taking the lead in the production of an unexceptionable almanac in Great Britain. The example thus set has been almost universally adopted. The circulation of

almanacs continued to be much cramped by the very heavy duty of one shilling and threepence per copy till 1834, when this duty was abolished. About 200 new almanacs were started immediately on the repeal.

Almanacs, from their periodical character, and the frequency with which they are referred to, are now more and more used as vehicles for conveying statistical and other useful information, some being intended for the inhabitants of a particular country or district, others for a particular class or party. Some of the almanacs that are regularly published every year are extremely useful, and are indeed almost indispensable to men engaged in official, mercantile, literary, or professional business. Such in Great Britain are *Thom's Official Directory of the United Kingdom*, *The British Almanac*, *Oliver and Boyd's New Edinburgh Almanac*, and *Whitaker's Almanac*, started in 1868.

In the United States is published *The American Almanac*, a useful compilation. The *Almanach de Gotha*, which has appeared at Gotha since 1764, contains in small bulk a wonderful quantity of information regarding the reigning families and Governments, the finances, commerce, population, etc., of the different States throughout the world. Since 1871 it is published both in a French and in a German edition. Among French almanacs the most famous was the *Almanach Liégeois*, whilst the *Almanach National*, first published in 1679 as *Almanach Royal*, is the most important of modern almanacs in France. Almanacs that pretend to foretell the weather and occurrences of various kinds are still popular in Britain, France, and elsewhere.

**The Nautical Almanac** is an important work published annually by the British Government, two or three years in advance, in which is contained much useful astronomical matter, more especially the distances of the moon from the sun, and from certain fixed stars, for every three hours of apparent time, adapted to the meridian of the Royal Observatory, Greenwich. By comparing these with the distances carefully observed at sea the mariner may, with comparative ease, infer his longitude to a degree of accuracy unattainable in any other way, and sufficient for most nautical purposes. This almanac was commenced in 1767 by Dr. Maskelyne, Astronomer Royal. The French *Connaissance des Temps* is published for the same purpose as the English *Nautical Almanac*, and nearly on the same plan. It commenced in 1679. Of a similar character is the *Astronomisches Jahrbuch* published at Berlin.

**ALMAN'DINE.** A mineral of a reddish or violet colour, a variety of precious or noble garnet.

**ALMAN'SA.** A town of south-eastern Spain (Murcia), near which was fought (25th April, 1707) a decisive battle in the War of the Spanish Succession, when the French, under the Duke of Berwick, defeated the Anglo-Spanish army under the Earl of Galway. Pop. 11,250.

**ALMAN'ZUR**, or **ALMANSUR.** A caliph of the Abasside dynasty, reigned 754-75. He was cruel and treacherous and a persecutor of the Christians, but a patron of learning.

**ALMA-TAD'EMA, Sir Lawrence.** Dutch painter, born in 1836, resided from 1870 in England, where he became a naturalized subject. He was made A.R.A. in 1876, R.A. in 1879, knighted in 1899, and awarded the Order of Merit in 1905. He died at Wiesbaden, 25th June, 1912. He is especially celebrated for his pictures of ancient Roman, Greek, and Egyptian life, which are painted with great realism and archæological correctness.

**AL'MEH.** The name given in Egypt to a class of girls whose profession is to sing for the amusement of the upper classes, as distinguished from the *gawasi*, who perform before the lower classes. They perform at feasts and other entertainments (including funerals), and many of them are skilful improvisatrici. One of their most famous dances is called "The Bee."

**ALMEIDA** (ál-mā'i-dà). One of the strongest fortresses in Portugal, in the province of Beira, near the Spanish border, on the Coa. Pop. 2350. Taken by Masséna from the English in 1810, retaken by Wellington in 1811.

**ALMEIDA** (dál-mā'i-dà), **Francisco d'.** First Portuguese viceroy of India, son of the Conde de Abrantes, born about the middle of the fifteenth century. He fought with renown against the Moors, and being appointed governor of the new Portuguese settlements on the African and Indian coasts, he sailed for India in 1505, accompanied by his son Lorenzo and other eminent men. In Africa he took possession of Quiloa and Mombas, and in the East he conquered Cananor, Cochin, Calicut, etc., and established forts and factories.

His son **Lorenzo** discovered the

Maldives and Madagascar, but perished in an attack made on him by a fleet sent by the Sultan of Egypt, with the aid of the Porte and the Republic of Venice. Having signally defeated the Mussulmans (1508), and avenged his son, and being superseded by Albuquerque, he sailed for Portugal, but was killed in a skirmish on the African coast in 1510.

**ALMELO'**. A town of Holland, province of Overyssel, on the Vechte; with manufactures of linen. Pop. 32,516.

**ALMENDRALEJO** (-ā'hō) A town of Spain, province of Badajoz, in a district rich in grain, wine, and fruits, with many brandy distilleries. Pop. 12,750.

**ALMERIA** (ål-mā-rē'å). A fortified seaport of Southern Spain, capital of province of Almeria, near the mouth of a river and on the gulf of same name, with no building of consequence except a Gothic cathedral, but with a large trade, exporting grapes, iron ore, lead, esparto, etc. The province, which has an area of 3391 sq. miles, is generally mountainous, and rich in minerals. Pop. of town, 53,977; of province, 363,179.

**ALMODO'VAR.** A town of Spain, province of Ciudad-Real (New Castile), near the Sierra Morena. Pop. 12,720.

**ALMOHADES** (al'mo-hādz). A Moorish dynasty that ruled in Africa and Spain in the twelfth and thirteenth centuries, founded by Mohammed Ibn Tumart, a religious enthusiast, who assumed the title of *Mahdi*. They overthrew the Almoravides in Spain, but themselves received a defeat in 1212 from which they did not recover, and in 1269 were overthrown in Africa, when Idris El-Wathik, their last emir, was murdered by a slave.

**AL-MOKANNA.** *See* MOKANNA.

**ALMOND** (å'mund). The fruit of the almond tree (*Amygdălus communis*), a tree which grows usually to the height of 20 feet, and is akin to the peach, nectarine, etc. (ord. Rosaceæ). It has beautiful pinkish flowers, that appear before the leaves, which are oval, pointed and delicately serrated. It is a native of Africa and Asia, naturalized in Southern Europe, and cultivated in England for its beauty, as it seldom produces edible fruit even in the warmer portions of Southern England. The fruit is a drupe, ovoid, and with downy outer surface; the fleshy covering is tough and fibrous; it covers the compressed wrinkled stone enclosing the seed or almond within it. There are two varieties, one sweet and the other bitter; both are produced from *A. communis*, though from different varieties.

Most of the sweet almonds imported into Britain come from Southern Europe, the Levant, and California, the finest being the Valencian, Jordan, and Malaga. They contain a bland fixed oil, consisting chiefly of olein. Bitter almonds come from Mogador, and besides a fixed oil they contain a substance called *emulsin*, and also a bitter crystalline substance called *amygdalin*, which, acting on the emulsin, produces prussic acid, whence the aroma of bitter almonds when mixed with water.

**Almond-oil,** a bland fixed oil, is expressed from the kernels of either sweet or bitter almonds, and is used by perfumers and in medicine. A poisonous essential oil is obtained from bitter almonds, which is used for flavouring by cooks and confectioners, also by perfumers and in medicine. The name *almond*, with a qualifying word prefixed, is also given to the seeds of other species of plants; thus *Java almonds* are the kernels of *Canarium commune*.

**ALMONDBURY** (å'mund-be-ri). A town of England, West Riding of Yorkshire, S.E. of Huddersfield, in which it is now included, with manufactures of woollens, cotton and silk goods.

**AL'MONER.** An officer of a religious establishment to whom belonged the distribution of alms. The grand almoner (*grand aumonier*) of France was the highest ecclesiastical digitary in that kingdom before the revolution. The lord almoner, or lord high almoner of England, is generally a bishop, whose office is well-nigh a sinecure. He distributes the sovereign's doles to the poor on Maundy Thursday.

**ALMO'RA.** A town and fortress of India, in the United Provinces, capital of Kumaon, 170 miles E.N.E. of Delhi, a thriving little place. Pop. about 10,560.

**ALMO'RAVIDES** (-vidz). A Moorish dynasty which arose in North-Western Africa in the eleventh century, and reigned from 1055-1147. The town of Marrakesh, built in 1062, became the capital of this dynasty. Having crossed the Straits of Gibraltar, the family gained possession of all Arabic Spain, but was overthrown by the Almohades in the following century.

**ALMSHOUSES.** Homes provided

for the poor. They are usually built by private individuals and consist of a number of small residences in a single building. Some are for men and others for women, while there are a few for married couples. In many cases the inmates receive a monetary allowance.

Many of these almshouses, or hospitals, as they were called, were founded in the Middle Ages in England, and some of them are very picturesque buildings. Notable almshouses are the hospital of S. Cross at Winchester and the Leycester Hospital at Warwick and the Charterhouse in London. Morden College at Blackheath belongs to a later date. Almshouses are maintained by some of the London livery companies. The Charity Commission now supervises the administration of the funds left for almshouses.

**AL'MUG** (or **AL'GUM**) **TREE.** Names which occur in 1 Kings x. 11, 12, and 2 Chron. ii. 8, and ix. 10, 11, as the names of trees of which the wood was used for pillars in the temple and the king's house, for harps and psalteries, etc. They are said in one passage to be hewn in Lebanon, in another to be brought from Ophir. They have been identified by critics with the red sandalwood of India. Some of them may possibly have been transplanted to Lebanon by the Phœnicians.

**ALMUÑECAR** (äl-mụn-ye-kär'). A seaport of Spain, Granada, on the Mediterranean. Pop. 8030.

**AL'NAGER.** Formerly, in England, an official whose duty it was to inspect, measure, and stamp woollen cloth.

**AL'NUS.** *See* ALDER.

**ALNWICK** (an'ik). A town of England, county town of Northumberland, 3¼ miles north of Newcastle, near the Aln. It is well built, and carries on tanning, brewing, and a general trade. The town is famous for the curious ceremonies which take place there annually during the election of the common council (25th March). Alnwick Castle, residence of the Dukes of Northumberland, for many centuries a fortress of great strength, stands close to the town. Pop. (1931), 6882.

**ALOE** (al'ō). The name of a number of plants belonging to the genus Aloë (ord. Liliaceæ), some of which are not more than a few inches, whilst others are 30 feet and upwards in height; natives of South Africa and Socotra; leaves fleshy, thick, and more or less spinous at the edges or extremity; flowers with a tubular corolla.

Some of the larger kinds are of great use, the fibrous parts of the leaves being made into cordage, fishing nets and lines, cloth, etc. The inspissated juice of several species is used in medicine, under the name of *aloes*, forming a bitter purgative.

The medicinal value of **bitter aloes** was known to the Greeks in the fourth century, B.C. According to the Arabian historian Edrisi, the occupation of Socotra by the Macedonians was due to Aristotle's persuading Alexander the Great to secure the monopoly of the supplies of the drug. The drug is said to have been commended to Alfred the Great by the Patriarch of Jerusalem, but a direct trade in it between Socotra and Britain was opened only in the seventeenth century. The principal drug-producing species are the **Socotrine aloe** (*A. Socotrina*); the **Barbadoes aloe** (*A. vulgāris*), first imported into Britain in 1693; the **Cape aloe** (*A. spicāta*), 1780; and **Natal aloes,** 1870; etc. A beautiful violet colour is yielded by the leaves of the Socotrine aloe. The **American aloe** (*see* AGAVE) is a different plant altogether; as are also the aloes or lign-aloes of Scripture, which are supposed to be the *Aquilaria Agallōchum*, or aloes-wood (q.v.). **Aloe fibre** is obtained from species of Aloë, Agave, Yucca, etc., and is made into coarse fabrics, ropes, etc.

**ALOES-WOOD, EAGLE-WOOD,** or **AGILAWOOD.** The inner portion of the trunk of *Aquilāria ovāta* and *A. Agallōchum*, forest trees belonging to the ord. Aquilariaceæ, found in tropical Asia, and yielding a fragrant resinous substance, which, as well as the wood, is burned for its perfume. Another tree, the *Aloexȳlon Agallōchum* (ord. Leguminosæ), also produces aloes-wood. This wood is supposed to be the lign-aloes (a corruption of the Lat. *lignum aloe*) of the Bible.

**ALOPE'CIA.** A variety of baldness in which the hair falls off from the beard and eyebrows, as well as the scalp.

**ALOPECU'RUS.** A genus of grasses. *See* FOXTAIL-GRASS.

**ALO'RA.** A town of Southern Spain, province of Malaga. Pop. 11,500.

**ALOST, or AALST** (ä'lost, älst). A town of Belgium, 15 miles W.N.W. of Brussels, on the Dender (here navigable), with a beautiful, though unfinished, church, and an ancient town hall (thirteenth century); manufactures of lace, thread, linen

and cotton goods, etc., and a considerable trade. In the market place stands a statue of Thierry Maartens, who introduced the art of typography into the Netherlands in 1473. The town was occupied by the Germans in 1914. Pop. 37,852.

**ALOYSIUS.** Italian saint. He was born March 9, 1568, the son of an Italian nobleman, and his name was Luigi Gonzaga. In 1585 he joined the Society of Jesus, but six years later he died of the plague caught while tending the sick in Rome (June 21, 1591). Aloysius, this being the name he took, is associated with the education of boys and many schools are named after him. He was canonized in 1726.

**ALPAC'A.** A ruminant mammal of the camel tribe, and genus Auchĕnia (*A. Paco*), a native of the Andes, especially of the mountains of Chile and Peru, and closely allied to the llama. Llamas and alpacas are mutually fertile when crossed,

Alpaca (*Auchĕnia Paco*)

and this explains the existence of intermediate forms between the two breeds. It has been domesticated, and remains also in a wild state. In form and size it approaches the sheep, but has a longer neck.

It is valued chiefly for its long, soft, and silky wool, which is straighter than that of the sheep, and very strong, and is woven into fabrics of great beauty, used for shawls, clothing for warm climates, coat-linings, and umbrellas, and known by the same name. Cloth made from imported alpaca wool is manufactured in England, principally in Yorkshire. Attempts have been made to introduce and acclimatize the alpaca in Europe and in Australia, but no measure of success has attended the experiments. Its flesh is pleasant and wholesome.

**ALPE'NA.** A town of the United States, Michigan, at the entrance of the Thunder into Lake Huron, with saw-mills, woollen factories, etc. Pop. 12,166.

**ALPEN-HORN,** or **ALP-HORN** (Ger.). A long, nearly-straight horn, curving slightly, and widening towards its extremity, used in the Alps to convey signals, or notice of something.

**ALPEN-STOCK** (Ger.). A strong, tall stick shod with iron, pointed at the end so as to take hold in, and give support on, ice and other dangerous places in climbing the Alps and other high mountains.

**ALPES** (ălp) The name of three departments in the south-east of France, all more or less covered by the Alps or their offshoots :—**Basses-Alpes** (bäs-ălp ; Lower Alps) has mountains rising to a height of 8000 to 10,000 feet, is drained by the Durance and its tributaries, and is the most thinly-peopled department in France ; area, 2697 sq. miles ; capital, Digne. Pop. 87,566.

**Hautes-Alpes** (ōt-ălp ; Upper Alps), mostly formed out of ancient Dauphiné, traversed by the Cottian and Dauphiné Alps (highest summits 12,000 feet), drained chiefly by the Durance and its tributaries. It is the lowest department in France in point of absolute population ; area, 2178 sq. miles ; capital, Gap. Pop. 87,566.—**Alpes-Maritimes** (ălp-mă-ri-tēm ; Maritime Alps) has the Mediterranean on the south, and mainly consists of the territory of Nice, ceded to France by Italy in 1860 The greater part of the surface is covered by the Maritime Alps ; the principal river is the Var. It produces in the south, cereals, vines, olives, oranges, citrons, and other fruits ; and there are manufactories of perfumes, liqueurs, soap, etc., and valuable fisheries. It is a favourite resort for invalids ; area, 1443 sq. miles ; capital, Nice. Pop. 493,376.

**AL'PHA and O'MEGA.** The first and last letters of the Greek alphabet, sometimes used to signify the beginning and the end, or the first and the last of anything ; also as a symbol of the Divine Being (Rev. i. 8 ; xxi. 6 ; xxii. 13). They were also formerly the symbol of Christianity, and engraved accordingly on the tombs of the ancient Christians. Some of these engravings are to be seen in the Louvre.

**AL'PHABET** (from *Alpha* and *Beta*, the two first letters of the Greek alphabet). The series of characters used in writing a language, and intended to represent the sounds of which it consists. The English alphabet, like most of those of modern Europe, is derived directly from the Latin, the Latin from the ancient Greek, and that from the Phœnician, which again is believed to have had its origin in the Egyptian hieroglyphics, although Egyptologists are not unanimous on this point. There is little evidence in support of the theory that the Phœnician alphabet had developed from the Assyrian cuneiform.

**Origin.** Some scholars, like Sir Arthur Evans, are of opinion that the Philistines established on the coast of Palestine had brought the alphabet over from Crete, and that from them it passed to the Phœnicians. The names of the letters in Phœnician and Hebrew must have been almost the same, for the Greek names, which, with the letters, were borrowed from the former, differ little from the Hebrew. By means of the names we may trace the process by which the Egyptian characters were transformed into letters by the Phœnicians. Some Egyptian character would, by its form, recall the idea of a house, for example, in Phœnician or Hebrew *beth*. This character would subsequently come to be used wherever the sound *b* occurred. Its form might be afterwards simplified, or even considerably modified, but the name would still remain, as *beth* still continues the Hebrew name for *b*, and *beta* the Greek. Our letter *m*, which in Hebrew was called *mim*, water, has still a considerable resemblance to the zigzag wavy line which had been chosen to represent water, as in the zodiacal symbol for *Aquarius*. The letter *o*, of which the Hebrew name means eye, no doubt was originally intended to represent that organ.

**History.** While the ancient Greek alphabet gave rise to the ordinary Greek alphabet and the Latin, the Greek alphabet of later times furnished elements for the Coptic, the Gothic, and the old Slavic alphabets. The Latin characters are now employed by a great many nations, such as the Italian, the French, the Spanish, the Portuguese, the English, the Dutch, the German, the Hungarian, the Polish, etc., each nation having introduced such modifications or additions as are necessary to express the sound of the language peculiar to it. The Greek alphabet originally possessed only sixteen letters, though the Phœnician had twenty-two. The original Latin alphabet, as it is found in the oldest inscriptions, consisted of twenty-one letters; namely, the vowels *a*, *e*, *i*, *o*, and *u* (*v*), and the consonants *b*, *c*, *d*, *f*, *h*, *k*, *l*, *m*, *n*, *p*, *q*, *r*, *s*, *t*, *x*, *z*. The Anglo-Saxon alphabet had two characters for the digraph *th*, which were unfortunately not retained in later English; it had also the character *æ*. It wanted *j*, *v*, *y* (consonant), and *z*. The German alphabet consists of the same letters as the English, but the sounds of some of them are different.

**Runes, etc.** Anciently certain characters called *Runic* were made use of by the Teutonic nations, to which some would attribute an origin independent of the Greek and Latin alphabets. Wimmer, the Danish scholar, is, however, of opinion that the *runes* were developed from the Latin alphabet. While the alphabets of the west of Europe are derived from the Latin, the Russian, which is very complete, is based on the Greek, with some characters borrowed from the Armenian, etc.; it is called *azbouka*, from the first two letters *az*, a, and *bouki*, b. Among Asiatic alphabets, the Arabian (ultimately of Phœnician origin) has played a part analogous to that of the Latin in Europe, the conquests of Mohammedanism having imposed it on the Persian, the Turkish, the Hindustani, etc.

The Sanskrit or Devanâgari alphabet is one of the most remarkable alphabets of the world. As now used it has fourteen characters for the vowels and diphthongs, and thirty-three for the consonants, besides two other symbols. Our alphabet is a very imperfect instrument for what it has to perform, being both defective and redundant. An alphabet is not essential to the writing of a language, since ideograms or symbols may be used instead, as in Chinese. *See* WRITING.—BIBLIOGRAPHY: E. Clodd, *The Alphabet* (Useful Knowledge Series, Hodder & Stoughton); Canon J. Taylor, *The Alphabet*; Philippe Berger, *Histoire de l'Écriture dans l'Antiquité*.

**ALPHA PARTICLE.** Positively charged particles of the alpha rays emitted from radio-active substances. They travel at a velocity of several thousand feet per second and have the property of causing scintillations of light when they strike a phosphorescent substance. Their charge is twice that of an electron and their mass four times that of a hydrogen nucleus.

**ALPH'ÊUS** (now **RUFIA**). The largest river of Peloponnesus, flowing

westwards into the Ionian Sea. In Greek mythology Alphêus is supposed to have been the son of Oceanus and Tethys.

**ALPHON'SO.** The name of a number of Portuguese and Spanish kings. Among the former may be mentioned **Alphonso I.,** the Conqueror, first King of Portugal, son of Henry of Burgundy, the conqueror and first Count of Portugal; born 1110, fought successfully against the Spaniards and the Moors, named himself King of Portugal, and was as such recognized by the Pope; died 1185.

**Alphonso V.,** the African, born in 1432; succeeded his father, Edward I., 1438; conquered Tangiers in 1471; died 1481. During his reign Prince Henry the Navigator continued the important voyages of discovery already begun by the Portuguese. Under him was drawn up an important code of laws.

Among kings of Spain may be mentioned **Alphonso X.,** King of Castile and Leon, surnamed the *Astronomer*, the *Philosopher*, or the *Wise* (El Sabio); born in 1226; succeeded in 1252. Being grandson of Philip of Hohenstaufen, son of Frederick Barbarossa, he endeavoured to have himself elected Emperor of Germany, and in 1257 succeeded in dividing the election with Richard, Earl of Cornwall. On Richard's death in 1272 he again unsuccessfully contested the imperial crown. Meantime his throne was endangered by conspiracies of the nobles and the attacks of the Moors. The Moors he conquered, but his domestic troubles were less easily overcome, and he was finally dethroned by his son Sancho, and died two years after, 1284. Alphonso was the most learned prince of his age. Under his direction or superintendence were drawn up a celebrated code of laws, valuable astronomical tables which go under his name (*Alphonsine Tables*), the first general history of Spain in the Castilian tongue, and a Spanish translation of the Bible.

**Alphonso V.** of Aragon, I. of Naples and Sicily, born in 1385, was the son of Ferdinand I. of Aragon, the throne of which he ascended in 1416, ruling also over Sicily and the Island of Sardinia. Queen Joanna of Naples made him her heir, but after her death in 1435 her will was disputed by René of Anjou. Alphonso now proceeded to take possession of Naples by force, which he succeeded in doing in 1442, and reigned till his death in 1458. He was an enlightened patron of literary men, by whom, in the latter part of his reign, his Court was thronged.

**Alphonso XII.,** King of Spain, the only son of Queen Isabella II. and her cousin Francis of Assisi, was born in 1857 and died in 1885. He left Spain with his mother when she was driven from the throne by the revolution of 1868, and till 1874 resided partly in France, partly in Austria. In the latter year he studied for a time at the Royal Military College, Sandhurst, being then known as Prince of the Asturias. His mother had given up her claims to the throne in 1870 in his favour, and in 1874 Alphonso came forward himself as claimant, and in the end of the year was proclaimed by General Martinez Campos as king. He now passed over into Spain and was enthusiastically received, most of the Spaniards being by this time tired of the republican Government, which had failed to put down the Carlist party. Alphonso was successful in bringing the Carlist struggle to an end (1876), and henceforth he reigned with little disturbance. His minister Canovas del Castillo ruined, however, Alphonso's popularity when he advised the king to conclude an alliance with Bismarck and Germany. He married first his cousin Maria de las Mercedes, daughter of the Duc de Montpensier; second, Maria Christina, Archduchess of Austria, whom he left a widow with two daughters and a son.

**Alphonso XIII.** Former King of Spain. He was born May 17, 1886, and was king from the day of birth, as his father, King Alphonso XII., was then dead. He was declared of age in 1906; before then his mother, Maria Christina, a member of the Hapsburg family, had been regent. On May 31, 1906, he married Victoria (Ena), daughter of Princess Henry of Battenberg and cousin of King George V. Their family consists of four sons and two daughters. In Spain the king made himself popular, although there were several attempts on his life—one on his wedding day—and he had to face grave political troubles. In 1930, there was serious disorder, which forced the king and his family to leave Spain. A republic was proclaimed, but the king refused to abdicate. With the queen and their children he took up his residence in France. Alphonso has shown a great liking for England, and was a frequent visitor to this country. In 1932 his property in Spain was confiscated by the state.

**ALPINE CLUB.** An association of English gentlemen, originating in 1856 or 1857, having as their common

bond of union a delight in making the ascent of mountains, in the Alps or elsewhere, difficult to ascend, and in investigating everything connected with mountains. Similar associations now exist in Germany, Austria, Switzerland, and France. Its house is at 23 Savile Row, London, S.W.

**ALPINE CROW,** or **ALPINE CHOUGH** (*Pyrrhocórax alpínus*). A European bird closely akin to the chough of England.

**ALPINE MUSEUM.** A museum established at Munich in 1911 by the German and Austrian Alpine Club. Its purpose is to spread knowledge about the Alps, and to disseminate the results of scientific research by means of exhibits and literary publications. Not only alpine geology, botany, and zoology, but also industry, custom, and costumes are well demonstrated in the exhibits.

**ALPINE PLANTS.** The name given to those plants whose habitat is in the neighbourhood of the snow, on mountains partly covered with it all the year round. As the height of the snow-line varies according to the latitude and local conditions, so also does the height at which these plants grow. The mean height for the alpine plants of Central Europe is about 6000 feet; but it rises in parts of the Alps and in the Pyrenees to 9000 feet, or even more. The high grounds clear of snow among these mountains present a very well marked flora, the general characters of the plants being a low dwarfish habit, a tendency to form thick turfs, stems partly or wholly woody, and large brilliantly-coloured and often very sweet-smelling flowers. They are also often closely covered with woolly hairs.

In the Alps of Middle Europe the eye is at once attracted by gentians, saxifrages, rhododendrons, primroses of different kinds, etc. Ferns and mosses of many kinds also characterize these regions. Some alpine plants are found only in one locality. Considerable success has attended the attempt to grow alpine plants in gardens, the first necessity being a situation where there is plenty of sunlight, and which is free from the shade of trees.

**ALPINE WARBLER** (*Accentor alpínus*). A European bird of the same genus as the hedge-sparrow.

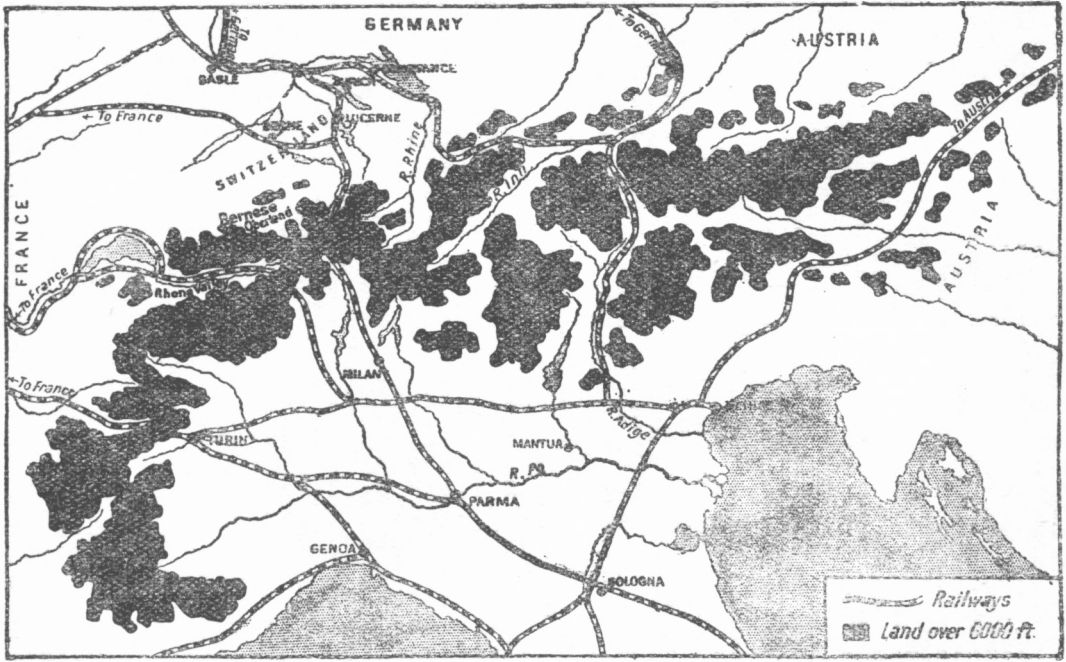
**ALPIN'IA.** A genus of plants. *See* GALANGA.

**ALPS.** The highest and most extensive system of mountains in Europe, included between lat. 44° and 48° N., and long. 5° and 18° E., covering a great part of Northern Italy, several departments of France, nearly the whole of Switzerland, and a large part of Austria, while its extensive ramifications connect it with nearly all the mountain systems of Europe. The culminating peak is Mont Blanc, 15,781 feet high, though the true centre is the St. Gothard, or the mountain mass to which it belongs, and from whose slopes flow, either directly or by affluents, the great rivers of Central Europe—the Danube, Rhine, Rhone, and Po.

**Formation.** Round the northern frontier of Italy the Alps form a remarkable barrier, shutting it off from the mainland of Europe, so that formerly it could hardly be approached from France, Germany, or Switzerland, except through high and difficult passes. In the west this barrier approaches close to the Mediterranean coast, and near Nice there is left a free passage into the Italian peninsula between the mountains and the sea. From this point eastward the chain proceeds along the coast till it forms a junction with the Apennines. In the opposite direction it proceeds north-west, and afterwards north to Mont Blanc, on the boundaries of France and Italy; it then turns north-east and runs generally in this direction to the Gross Glockner, in Central Tyrol, between the Rivers Drave and the Salza, where it divides into two branches, the northern proceeding north-east towards Vienna, the southern towards the Balkan Peninsula.

The principal valleys of the Alps run mostly in a direction nearly parallel with the principal ranges, and therefore east and west. The transverse valleys are commonly shorter, and frequently lead up through a narrow gorge to a depression in the main ridge between two adjacent peaks. These are the passes or *cols*, which may usually be found by tracing a stream which descends from the mountains up to its source.

**Divisions.** The Alps in their various great divisions receive different names. The **Maritime Alps,** so called from their proximity to the Mediterranean, extend westward from their junction with the Apennines for a distance of about 100 miles; culminating points Aiguille de Chambeyron, 11,155 feet, and Grand Rioburent, 11,142 feet; principal pass, the Col di Tende (6145 feet), which was made practicable for carriages by Napoleon I. Proceeding northward the next group consists of the **Cottian Alps,** length about 60 miles; principal peaks:




MAP OF CONTOURS, ALPINE LANDS

Monte Viso, 12,609 feet; Pic des Écrins, 13,462; Pelvoux, 12,973. Next come the **Graian Alps**, 50 miles long, with extensive ramifications in Savoy and Piedmont; principal peaks: Aiguille de la Sassière, 12,323 feet; Grand Paradis, 13,300; Grande Casse, 12,780. To this group belongs Mont Cenis (6765 feet), over which a carriage road was constructed by Napoleon I., while a railway now passes through the mountain by a tunnel nearly 8 miles long. These three divisions of the Alps are often classed together as the **Western Alps**, while the portion of the system immediately east of this forms the **Central Alps**. The **Pennine Alps** form the loftiest portion of the whole system, having Mont Blanc (in France) at one extremity, and Monte Rosa at the other (60 miles), and including the Alps of Savoy and the Valais.

In the east the valley of the Upper Rhone separates the Pennine Alps from the great chain of the **Bernese Alps** running nearly parallel, the great peaks of the two ranges being about 20 miles apart. The principal heights of the Pennine Alps are Mont Blanc, 15,781 feet; Monte Rosa, 15,217; Mischabelhörner (Dom), 14,942; Weisshorn, 14,804; Matterhorn, 14,775. In the Bernese Alps the Finsteraarhorn, 14,025; Aletschhorn, 13,803; Jungfrau, 13,671. The pass of Great St. Bernard is celebrated for its hospice. The most easterly pass is the Simplon, 6595 feet, with a carriage road made by Napoleon I., and a tunnel leading into Italy, fully 12 miles long.

Farther east are the **Lepontine Alps**, which give off a number of streams that feed the Italian lakes—Maggiore, Como, etc. The principal pass is the St. Gothard (6935 feet), over which a carriage road leads to Italy, while through this mountain mass a railway tunnel more than 9 miles long has been opened. Highest peaks: Tödi, 11,887 feet; Monte Leone, 11,684. The **Rhætian Alps**, extending east to about lon. 12° 30′, are the most easterly of the Central Alps, and are divided into two portions by the Engadine, or valley of the Inn, and also broken by the valley of the Adige; principal peaks: Piz Bernina, 13,304 feet; Ortlerspitze, 12,814; Monte Adamello, 11,832. The Brenner Pass (4495 feet), from Verona to Innsbruck, and between the Central and Eastern Alps, is crossed by a railway.

On the railway from Innsbruck to the Lake of Constance is the Arlberg Tunnel, over 6 miles long. The **Eastern Alps** form the broadest and lowest portion of the system, and embrace the **Noric Alps**, the **Carnic Alps**, the **Julian Alps**, etc.; highest peak, the Gross Glockner, 12,461 feet. The height of the south-eastern continuations of the Alps rapidly diminishes, and they lose themselves in ranges having nothing in common with the great mountain masses which distinguish the centre of the system.

**Lakes and Streams.** The Alps are very rich in lakes and streams. Among the chief of the former are the lakes of Geneva, Constance, Zürich, Thun, Brienz, on the north side; on the south Maggiore, Como, Lugano, Garda, etc. The drainage is carried to the North Sea by the Rhine, to the Mediterranean by the Rhone, to the Adriatic by the Po, to the Black Sea by the Danube.

**Climate.** In the lower valleys of the Alps the mean temperature ranges from 50° to 60°. Half-way up the Alps it averages about 32°—a height which in the snowy regions it never reaches. But even where the temperature is lowest the solar radiation produced by the rocks and snow is often so great as to raise the photometer to 120° and even higher. The exhilarating and invigorating nature of the climate in the upper regions during summer has been acknowledged by all.

**Flora.** In respect to vegetation the Alps have been divided into six zones, depending on height modified by exposure and local circumstances. The first is the olive region. This tree flourishes better on sheltered slopes of the mountains than on the plains of Northern Italy. The vine, which bears greater winter cold, distinguishes the second zone. On slopes exposed to the sun it flourishes to a considerable extent. The third is called the mountainous region. Cereals and deciduous trees form the distinguishing features of its vegetation. The mean temperature about equals that of Great Britain, but the extremes are greater. The fourth region is the sub-Alpine or coniferous. Here are vast forests of pine of various species. Most of the Alpine villages are in the two last regions. On the northern slopes pines grow to 6000, and on the southern slopes to 7000 feet above the level of the sea. This is also the region of the lower or permanent pastures where the flocks are fed in winter.

The fifth is the pasture region, the term *alp* being used in the local sense of high pasture grounds. It extends from the uppermost limit of trees to the region of perpetual snow. Here there are shrubs, rhododendrons, junipers, bilberries, and dwarf willows, etc. The sixth zone is

the region of perpetual snow. The line of snow varies, according to seasons and localities, from 8000 to 9500 feet, but the line is not continuous, being often broken in upon. Few flowering plants extend above 10,000 feet, but they have been found as high as 12,000 feet.

**Fauna.** At this great elevation are found the wild goat and the chamois. In summer the high mountain pastures are covered with large flocks of cattle, sheep, and goats, which are in winter removed to a lower and warmer level. The marmot, and white or Alpine hare, inhabit both the snowy and the woody regions. Lower down are found the wild-cat, fox, lynx, bear, and wolf; the last two are now extremely rare. The vulture, eagle, and other birds of prey frequent the highest elevations, the ptarmigan seeks its food and shelter among the diminutive plants that border upon the snow-line. Excellent trout and other fish are found; but the most elevated lakes are, from their low temperature, entirely destitute of fish.

The **geological structure** of the Alps is highly involved, and is far, as yet, from being thoroughly investigated or understood. In general three zones can be distinguished, a central, in which crystalline rocks prevail, and two exterior zones, in which sedimentary rocks predominate. The rocks of the central zone consist of granite, gneiss, hornblende, mica, slate, and other slates and schists. In the western Alps there are also considerable elevations in the central zone that belong to the Jurassic (Oolite) and Cretaceous formations. From the disposition of the beds, which are broken, tilted, and distorted on a gigantic scale, the Alps appear to have been formed by a succession of disruptions and elevations extending over a very protracted period. Among the minerals that are obtained are iron and lead, gold, silver, copper, zinc, alum, and coal.

**Scenery.** Extensive views of Alpine scenery are now commanded by means of special railways climbing to the summit of Mont Blanc, the Jungfrau, and other mountains. The Rigi railway was one of the earliest constructed of these. Here there are hotels at the top, 5905 feet above the level of the sea, and 4468 above the Lake of Lucerne. A favourite view from hence is to watch the sun rise over the Bernese Alps. The Becca di Nona (8415 feet), south of Aosta, gives, according to some authorities, the finest panomaric view to be obtained from any summit of the Alps. The most accessible glaciers are those of Aletsch, Chamonix, and Zermatt.

**ALPUJARRAS** (ål-pö-*hår*'rås). A district of Spain, in Andalusia, between the Sierra Nevada and the Mediterranean, mountainous, but with rich and well-cultivated valleys, yielding grain, vines, olives, and other fruits. The inhabitants are Christianized descendants of the Moors.

**ALQUIFOU** (al'ki-fö). A sort of lead ore used by potters as a green varnish or glaze.

**ALSACE** (ål-sås; Ger. *Elsass*). Before the French revolution a province of France, on the Rhine, afterwards constituting the French departments of Haut- and Bas-Rhin, and subsequently to the Franco-Prussian war of 1870-1 annexed by Germany, and incorporated in the province of Elsass-Lothringen (Alsace-Lorraine). Alsace is generally a level country, though there are several ranges of low hills richly wooded. The principal river is the Ill. Corn, flax, tobacco, grapes, and other fruits are grown. Area, 3202 sq. miles. Pop 1,216,625. Alsace was originally a part of ancient Gaul. It afterwards became a dukedom of the German Empire. In 1268, the line of its dukes becoming extinct, it was parcelled out to several members of the empire. By the peace of Westphalia, in 1648, a great part of it was ceded to France, which afterwards seized the rest of it, this seizure being recognized by the peace of Ryswick, in 1697.

**ALSACE-LORRAINE.** The imperial territory, or Reichsland of Elsass-Lothringen, taken by Germany from France in 1871, and restored to France in 1918. The province is partly bounded by the Rhine; area, 5605 sq. miles. Pop. 1,898,376. Under the German system the province was divided into three districts, namely, Lorraine, Upper Alsace, and Lower Alsace, and governed by a Statthalter, having his seat at Strassburg. By the law of 31st May, 1911, a constitution was granted to Alsace-Lorraine, by which it received three votes in the Federal Council. After the signing of the armistice, French troops occupied Alsace-Lorraine, and the French Government, by a decree of 26th Nov., 1918, took over the administration of the restored territories, and French officials were installed.

The three chief towns are Strassburg, Mulhausen, and Metz. About 76 per cent of the inhabitants are Roman Catholics, 22 per cent Evangelical, and between 1 and 2 per cent

Jews. The chief crops are wheat, rye, barley, oats, potatoes, and hay; the potash deposits of Alsace are superior to and more extensive than those of Strassfurt, Germany. *See* FRANCE; MOSELLE.—BIBLIOGRAPHY: M. Harrison, *The Stolen Lands: a Study on Alsace-Lorraine*; G. W. Edwards, *Alsace-Lorraine*.

**ALSA'TIA.** Formerly a cant name for Whitefriars, a district in London between the Thames and Fleet Street and adjoining the Temple, which, possessing certain privileges of sanctuary, became for that reason a nest of mischievous characters who were liable to be arrested. These privileges were abolished in 1697. The name Alsatia is a Latinized form of Alsace, which, being on the frontiers of France and Germany, was a harbour for necessitous or troublesome characters from both countries.

**ALSATIAN.** Large wolfhound originally used to protect sheep in Alsace. It became popular in Great Britain in the 20th century as a companion and watchdog, but is rather untrustworthy. Its ears should be stiffly erect and it should have a deep chest and strong feet.

**AL'SEN.** An island on the east coast of Schleswig-Holstein; length, 20 miles, breadth, from 5 to 7 miles, diversified with forests, lakes, well-cultivated fields, orchards, and towns. Pop. 25,000.

**AL SIRAT** (sē'rat). In Mahommedan belief the bridge extending over the abyss of hell, which must be crossed by everyone on his journey to heaven. It is finer than a hair, as sharp as the edge of a sword, and beset with thorns on either side. The righteous will pass over with ease and swiftness, but the wicked will fall into hell below.

**ALSTRŒME'RIA.** A genus of South American plants, ord. Amaryllidaceæ, some of them cultivated in European greenhouses and gardens. *A. Salsilla* and *A. ovāta* are cultivated for their edible tubers.

**ALTAIC LANGUAGES** (also called **URAL-ALTAIC** and **TURANIAN**). A family of languages occupying a portion of Northern and Eastern Europe, and nearly the whole of Northern and Central Asia, together with some other regions, and divided into five branches, the Ugrian or Finno-Hungarian, Samoyedic, Mongolic, Turkic, and Tungusic.

**ALTAI MOUNTAINS** (ăl'tī). An important Asiatic system on the borders of Siberia and Mongolia, partly in Russian and partly in Chinese territory, between lat. 46° and 53° N., long. 83° and 91° E., but having great eastern extensions. The Russian portion is comprised in the governments of Tomsk and Semipalatinsk, the Chinese in Dsungaria. The rivers of this region, which are large and numerous, are mostly headwaters of the Obi and Irtish. The mountain scenery is generally grand and interesting. The highest summit is Byeluka (" white mountain," from its snowy top), height 14,890 feet. The area covered by perpetual snow is very considerable, and glaciers occupy a large area. In the high lands the winter is very severe, but on the whole the climate is comparatively mild and is also healthy.

The flora of the Altai Mountains greatly resembles that of the Alps, about five-sixths of the latter being found here. The mountain forests are composed of birch, alder, aspen, fir, larch, stonepine, etc. The wild sheep has here its native home, and several kinds of deer are found. The Altai is exceedingly rich in minerals, including gold, silver, copper, and iron. The name Altai means " gold mountain." The inhabitants are chiefly Russians and Kalmuks. The chief town is Barnaul.

**ALTAMU'RA.** A town of South Italy, province of Bari, at the foot of the Apennines, walled, well built, and containing a magnificent cathedral. Pop. 27,000.

**ALTAR** (ăl'tar). Any pile or structure raised above the ground for receiving sacrifices to some divinity. Amongst the Semites the altar was primarily the place where the victim was slaughtered, and amongst the Indo-Germanic peoples the place where it was burnt. The Greek and Roman altars were various in form, and often highly ornamental; in temples they were usually placed before the statue of the god. In the Jewish ceremonial the altar held an important place, and was associated with many of the most significant rites of religion. Two altars were erected in the tabernacle in the wilderness, and the same number in the temple.

In most sections of the Christian Church the communion-table, or table on which the eucharist is placed, is called an altar. In the primitive Church it was a table of wood, but subsequently stone and metal were introduced with rich ornaments, sculpture, and painting. After the introduction of Gothic art the altar frequently became a lofty and most elaborate structure. Originally there was but one altar in a church, but later on there might be several in a large church, the chief

or *high altar* standing at the east end. Over an altar there is often a painting (an *altar-piece*), and behind it there may be an ornamental *altar-screen* separating the choir from the east end of the church.

**ALTAZ'IMUTH** (also called **UNIVERSAL INSTRUMENT**). An astronomical instrument similar to a theodolite, having a telescope so mounted that it can be turned round in a plane perpendicular to the horizon, while it and the graduated vertical circle connected can also be turned horizontally to any point of the compass above a graduated horizontal circle. The altazimuth can thus determine the altitude and azimuth of objects, hence the name.

**ALTCAR.** Village of Lancashire. It is 11 miles from Liverpool, on the L.M.S. Rly. On the flats here the Waterloo Cup is competed for every February.

**ALTDORF.** *See* ALTORF.

**AL'TENA.** A town of Prussia, Westphalia, 40 miles N.N.E. of Cologne; it has wire-works, rolling-mills, chain-works, manufactories of needles, pins, thimbles, etc. Pop. 14,579.

**AL'TENBURG.** A town of Germany, capital of Saxe-Altenburg, 23 miles south of Leipzig. It has some fine streets and many handsome buildings, including a splendid palace; it manufactures cigars, woollen yarn, gloves, hats, musical instruments, glass, brushes, etc. Pop. 42,570.

**ALTERATIVES** (al'-). Medicines, as mercury, iodine, etc., which, administered in small doses, gradually induce a change in the habit or constitution, and imperceptibly alter disordered secretions and actions, and restore healthy functions without producing any sensible evacuation by perspiration, purging, or vomiting.

**ALTER EGO** (Lat., "another I"). A second self, one who represents another in every respect. This term was formerly given, in the official style of the Kingdom of the Two Sicilies, to a substitute appointed by the king to manage the affairs of the kingdom, with full royal power.

**ALTER'NATE.** In botany, placed on opposite sides of an axis at a different level, as leaves.— **Alternate generation,** the reproduction of young not resembling their parents, but their grandparents, continuously, as in the jellyfishes, etc. *See* GENERATIONS, ALTERNATION OF.

**ALTERNATOR.** *See* ELECTRICITY.

**ALTHÆ'A.** A genus of plants. *See* HOLLYHOCK and MARSH-MALLOW.

**ALTHORN.** One of the instruments of the sax-horn family, the tenor sax-horn. *See* SAX-HORN.

Alternate leaves

**AL'TISCOPE.** An instrument consisting of an arrangement of mirrors in a vertical framework, by means of which a person is enabled to overlook an object (a parapet, for instance) intervening between himself and any view that he desires to see, the picture of the latter being reflected from a higher to a lower mirror, where it is seen by the observer.

**AL'TITUDE.** In mathematics, the perpendicular height of the vertex or apex of a plane figure or solid above the base. In astronomy it is the vertical height of any point or body above the horizon. It is measured or estimated by the angle subtended between the object and the plane of the horizon, and may be either *true* or *apparent*. The *apparent* altitude is that which is obtained immediately from observation; the *true* altitude that which results from correcting the apparent altitude, by making allowance for parallax, refraction, etc. Altitude is one of the main determining influences of local climate. Its increase has the same effect on temperature as an increase of distance north or south of the equator.

**ALTITUDE-AND-AZIMUTH INSTRUMENT.** *See* ALTAZIMUTH.

**ALTO.** In music, the highest singing voice of a male adult, the lowest of a boy or a woman, being in the latter the same as *contralto*. The alto, or *counter-tenor*, is not a natural voice, but a development of the *falsetto*. It is almost entirely confined to English singers, and the only music written for it is by English composers. It is especially used in cathedral compositions and glees.

**ALTOFTS.** A town of England, West Riding of Yorkshire, on the south of the Calder, 3 miles north-east of Wakefield, with a fourteenth-century Gothic church, and extensive collieries adjoining. Pop. (1931), 4980 (urban district).

**AL'TONA.** An important commercial city of Schleswig-Holstein, on the right bank of the Elbe, adjoining Hamburg, with which it virtually forms one city. It is a free port, and its commerce, both inland and foreign, is large, being quite iden-

Alto-rilievo.—Soldiers of the Prætorian Guard, the personal body-guard of the Emperor Augustus (in the Louvre, Paris)

**AL'TON.** A town of England, in Hampshire, 17½ miles north-east of Winchester, famous for its ale. Pop. (1931), 6172.

**AL'TON.** A town of the United States, in Illinois, on the Mississippi near the mouth of the Missouri, with a state penitentiary, several mills and manufactories, and in the neighbourhood limestone and coal. Pop. 30,151.

tified with that of Hamburg. Pop 227,430.

**ALTON TOWERS.** A pleasur resort in Staffordshire about 4 m from Cheadle. Its gardens, stretchir down to the River Churnet, ar famous and are decorated with foun tains, temples and statues.

**ALTOO'NA.** A town of the Unite States, in Pennsylvania at the easte base of the Alleghanies, 244 mil

west of Philadelphia, with large machine-shops and locomotive factories. Pop. 82,054.

**AL'TORF, or ALTDORF.** A small town of Switzerland, capital of the canton of Uri, beautifully situated near the Lake of Lucerne, amid gardens and orchards, and memorable as the place where, according to legend, Tell shot the apple from his son's head. A colossal statue of Tell now stands here. The town possesses a beautiful church containing a remarkable organ and a picture by Van Dyck. Pop. 4130.

**ALTO-RILIEVO** (ål'tō-rē-lē-ā'vo). High relief, a term applied in regard to sculptured figures to express that they stand out boldly from the background, projecting more than half their thickness, without being entirely detached. In mezzo-rilievo, or middle relief, the projection is one-half, and in basso-rilievo, or bas-relief, less than one-half. Alto-rilievo is further distinguished from mezzo-rilievo by some portion of the figures standing usually quite free from the surface on which they are carved, while in the latter the figures, though rounded, are not detached in any part.

**ALTÖTTING** (ålt-eut'ing). A famous place of pilgrimage, in Bavaria, 52 miles E.N.E. of Munich, near the Inn, with an ancient image of the Madonna (the Black Virgin) in a chapel dating from 696, and containing a rich treasure in gold and precious stones; and another chapel in which Tilly was buried. Pop. 5408.

**ALTRANSTADT** (ålt'-rån-stet). A village of Saxony, where a treaty was concluded between Charles XII., King of Sweden, and Augustus, Elector of Saxony and King of Poland, 24th Sept., 1706, by which the latter resigned the crown of Poland.

**ALT'RINGHAM, or ALTRINCHAM.** A town of England, in Cheshire, 8½ miles south-west of Manchester, resorted to by invalids; large quantities of fruit and vegetables are raised; and there are several industrial works. Also a Parliamentary division of the county. Pop. (1931), 21,356.

**AL'TRUISM.** A term first employed by the French philosopher Comte, to signify devotion to others or to humanity: the opposite of *selfishness* or *egoism*. It was adopted by the English positivists and applied to sociological problems of the physical theory of organic evolution. Herbert Spencer gives considerable space to the discussion of altruism and egoism in his *Data of Ethics*.

**ALTSTATTEN** (ålt'stet-n). A town of Switzerland, canton St. Gall, in the valley of the Rhine, 10 miles south of the Lake of Constance, with manufactures of cotton and woollen goods. Pop. 8743.

**ALTWASSER** (ålt'vås-ér). A town of Prussia, in Silesia, 35 miles south-west of Breslau, now forming part of Waldenburg; here are made porcelain, machinery, iron, yarn, mirrors, etc. Pop. 17,321.

**AL'UM.** A well-known crystalline, astringent substance with a sweetish taste, a double sulphate of potassium and aluminium with water of crystallization; formula, $K_2SO_4 . Al_2(SO_4)_3 . 24\ H_2O$. It crystallizes in colourless regular octahedra. Its solution reddens vegetable blues. When heated, its water of crystallization is driven off, and it becomes light and spongy with slightly corrosive properties, and is used as a caustic under the name of **burnt alum.**

Alum is prepared in Great Britain at Whitby from alum-slate—where it forms the cliffs for miles—and was once manufactured near Glasgow from bituminous alum-shale and slate-clay, obtained from old coal-pits. It is also prepared near Rome from alum-stone. **Common alum** is strictly **potash alum**; other two varieties are **soda alum** and **ammonia alum** both similar in properties. **Iron alum** (pale mauve) and **chrome alum** (deep purple) are compounds containing iron and chromium in place of aluminium.

Alum is employed to harden tallow, to remove grease from printers' cushions and blocks in calico manufactories, and in dyeing as a mordant. It is also largely used in the composition of crayons, in tannery, and in medicine (as an astringent and styptic). Wood and paper are dipped in a solution of alum to render them less combustible.

**ALUMBAGH** (*a-lam-bäg'*). A palace and connected buildings in India, about 4 miles south of Lucknow. On the outbreak of the Indian Mutiny it was occupied by the revolted Sepoys, and converted into a fort. On the 23rd Sept., 1857, it was captured by the British, and during the following winter a British garrison, under Sir James Outram, held out there, though repeatedly attacked by overwhelming numbers of the rebels, till in March, 1858, it was finally relieved. Sir Henry Havelock was buried within the grounds.

**ALU'MINA** ($Al_2O_3$). The single oxide of the metal aluminium. As

found native it is called corundum, when crystallized ruby or sapphire, when amorphous emery. It is next to the diamond in hardness. In combination with silica it is one of the most widely distributed of substances, as it enters in large quantity into the composition of granite, traps, slates, schists, clays, loams, and other rocks. The porcelain clays and kaolins contain about half their weight of this earth, to which they owe their most valuable properties. It forms compounds with certain colouring matters, which causes it to be employed in the preparation of the colours called *lakes* in dyeing and calico-printing. It combines with the acids and forms numerous salts, the most important of which are the sulphate (*see* ALUM) and acetate, the latter of extensive use as a mordant.

**ALUMIN'IUM** (symbol Al, atomic weight 27.1). A metal discovered in 1827, but nowhere found native, although its oxide, alumina (which see), is abundantly distributed. The minerals *bauxite* and *cryolite* are sources of aluminium, but the chief source is the pure oxide, from which the metal is obtained by means of a strong electric current. It is a shining white metal, of a colour between that of silver and platinum, very light (specific gravity, 2.56 cast, 2.67 hammered), not liable to tarnish nor undergo oxidation in the air, very ductile and malleable, and remarkably sonorous.

It forms several useful alloys with iron and copper; one of the latter (*aluminium gold*) much resembles gold, and is made into cheap trinkets. Another, known as *aluminium bronze*, possesses great hardness and tenacity. Aluminium and its alloys are used for optical, surgical, electrical, and chemical apparatus, cooking vessels, and for aeroplanes and air-ships.

**ALUM-ROOT.** The name given in America to two plants from the remarkable astringency of their roots, which are used for medical purposes: *Geránium maculátum* and *Heuchéra americána* (nat. ord. Saxifragaceæ).

**ALUM-SLATE,** or **ALUM-SCHIST.** A slaty rock from which much alum is prepared; colour greyish, bluish, or iron-black; often possessed of a glossy or shining lustre; chiefly composed of clay (silicate of alumina), with variable proportions of sulphide of iron (iron-pyrites), lime, bitumen, and magnesia.

**ALUM-STONE.** *See* ALUNITE.

**ALUNITE.** A mineral sulphate of aluminium and potassium, greyish or yellowish white, from which alum is prepared in Sicily by roasting and lixiviation. It is regarded as a possible source of potassium for agriculture and also of aluminium. A considerable vein occurs in Utah.

**ALUN'NO, Niccolo** (real name **NICCOLO DE LIBERATORE**). An Italian painter of the fifteenth century, the founder of the Umbrian School, born in Foligno about 1430, died 1502. Vasari, interpreting wrongly the passage "Nicholaus alumnus Fulginiæ," gave him the name of Alunno.

**AL'VA.** A burgh of Scotland, in Clackmannanshire, 2½ miles north of Alloa, near the river Devon, at the foot of the Ochils. It manufactures woollen shawls, tweeds, yarn, etc. Pop. (1931), 3820.

**AL'VA,** or **AL'BA, Ferdinand Alvarez, Duke of.** Spanish statesman and general under Charles V. and Philip II., was born in 1508; early embraced a military career, and fought in the wars of Charles V. in France, Italy, Africa, Hungary, and Germany. He is more especially remembered for his bloody and tyrannical government of the Netherlands (1567-73), which had revolted, and which he was commissioned by Philip II. to reduce to entire subjection to Spain.

Among his first proceedings was to establish the "Council of Blood," a tribunal which condemned, without discrimination, all whose opinions were suspected, and whose riches were coveted. The present and absent, the living and the dead, were subjected to trial and their property confiscated. Many merchants and mechanics emigrated to England; people by hundreds of thousands abandoned their country. The Counts of Egmont and Horn, and other men of rank, were executed, and William and Louis of Orange had to save themselves in Germany. The most oppressive taxes were imposed, and trade was brought completely to a standstill. As a reward for his services to the faith the Pope presented him with a consecrated hat and sword, a distinction previously conferred only on princes.

Resistance was only quelled for a time, and soon the provinces of Holland and Zealand revolted against his tyranny. A fleet which was fitted out at his command was annihilated, and he was everywhere met with insuperable courage. Hopeless of finally subduing the country he asked to be recalled, and accordingly, in Dec., 1573, Alva left the country, in which, as he himself boasted, he had executed 18,000 men. He was received with distinction in

Madrid, but did not long enjoy his former credit. He had the honour, however, before his death (which took place in 1582) of reducing all Portugal to subjection to his sovereign. It is said of him that during sixty years of warfare he never lost a battle and was never taken by surprise.

**ALVARADO** (ål-vå-rä′dō), **Pedro de.** One of the Spanish "conquistadores," was born towards the end of the fifteenth century, and died in 1541. Having crossed the Atlantic, he was associated (1519) with Cortez in his expedition to conquer Mexico; and was entrusted with important operations. In July, 1520, during the disastrous retreat from the capital after the death of Montezuma, the perilous command of the rear-guard was assigned to Alvarado. On his return to Spain he was received with honour by Charles V., who made him governor of Guatemala, which he had himself conquered. To this was subsequently added Honduras. He continued to add to the Spanish dominions in America till his death.

**ALVAREZ** (ål-vå-reth′), **Don José.** A Spanish sculptor, born 1768, died 1827. His works are characterized by truth to nature, dignity, and feeling, one of the chief representing a scene in the defence of Saragossa. The Museo del Prado, in Madrid, contains some of his finest work.

**ALVE′OLUS.** One of the sockets in which the teeth of mammals are fixed. Hence **alveolar arches,** the parts of the jaws containing these sockets.

**ALVERSTOKE.** *See* GOSPORT.

**ALVERSTONE, Richard Everard Webster.** First Viscount, eminent English lawyer, born in 1842, died in 1915. Educated at King's College School, the Charterhouse, and Trinity College, Cambridge, he was called to the bar in 1868, and made Q.C. in 1878. He was Member of Parliament for Launceston for a short time in 1885, and from that year to 1900 represented the Isle of Wight. He was Attorney-General from 1885-6, 1886-92, and 1895-1900, being then made Lord Chief Justice and elevated to the peerage: he had been created a baronet in 1899. He represented Britain in the arbitration with the United States regarding the Behring Sea (1893), in the affair of the Venezuelan and Guiana boundary (1898-9), and was one of three British commissioners who, with three from the United States, settled the Canada and Alaska boundary in 1903. Upon retiring in 1913 he was created viscount. His book *Recollections of Bar and Bench* was published in 1914.

**ALWAR** (*al-war′*). A State of north-western India, in Rajputana; area, 3141 sq. miles; surface generally elevated and rugged, and much of it of an arid description, though water is generally found on the plains by digging a little beneath the surface, and the means of irrigation being thus provided the soil, though sandy, is highly productive. This semi-independent State has as its ruler a rajah with a revenue of £232,000; military force, about 5000 infantry and 2000 cavalry. Pop. 828,480.

**Alwar,** the capital, is situated at the base of a rocky hill crowned by a fort, 80 miles S.S.W. of Delhi. It is surrounded by a moat and rampart, and is poorly built, but has fine surroundings; it contains the rajah's palace and a few other good buildings. Pop. 44,760.

**ALYS′SUM** (*A. saxatile,* L.). A native of Crete, a genus of cruciferous plants, several species of which are cultivated on account of their white or yellow coloured flowers; madwort.

**ALYTH** (ā′lith). A burgh of Scotland, Perthshire, near the eastern boundary, with linen and jute manufactures. Pop. (1931), 1662.

**AMAD′AVAT** (*Estrilda amandāva*). A small Indian singing bird allied to the finches and buntings; the female is olive-brown, and the male, in summer, largely crimson.

**AMADE′US.** The name of several counts of Savoy. The first was the son of Humbert I., and succeeded him in 1048, dying about 1078; others who have occupied an important place in history are the following: — **Amadeus V.,** "the Great," succeeded in 1285; gained great honour in defending Rhodes against the Turks; increased his possessions by marriage and war; was made a prince of the empire; died in 1323.—**Amadeus VIII.** succeeded his father, Amadeus VII., in 1391, and had his title raised to that of duke by the Emperor Sigismund. He was chosen regent of Piedmont; but after this elevation retired from his throne and family into a religious house. He now aspired to the papacy, and was chosen by the Council of Basel (1439), becoming Pope, or rather anti-Pope, under the name of Felix V., though he had never taken holy orders. He was recognized as Pope by only a few princes, and resigned in 1449, being the last of the anti-Popes. He died in 1451.

**AMADE'US, Duke of Aosta.** For a short time King of Spain, second son of Victor Emanuel of Italy, and brother of Humbert I., King of Italy. He was born in 1845, and, thanks to the influence of Marshals Prim and Serrano, was chosen by the Cortes King of Spain in 1870, Queen Isabella having had to leave the country in 1868. He made his entrance into Madrid as king on 2nd Jan., 1871, and took the oath to the constitution. His position was far from comfortable, however, and, having little hope of becoming acceptable to all parties, he abdicated in 1873 (11th Feb.). He died in 1890.

**AMADE'US, Lake.** A large salt lake or salt swamp in South Australia, and nearly in the centre of Australia. It was discovered by Giles in 1872, and is seldom visited, being in a dreary, arid region.

**AM'ADIS.** A name belonging to a number of heroes in the romances of chivalry, **Amadis de Gaul** being the greatest among them, and represented as the progenitor of the whole. The Spanish series of Amadis romances is the oldest. It is comprised in fourteen books, of which the first four narrate the adventures of Amadis de Gaul, this portion of the series having originated about the end of the thirteenth or beginning of the fourteenth century, and the subsequent books being added by various hands. An abridged English translation of *Amadis of Gaul* was published by Southey in 1803.

**AMADOU** (am'a-dö). A name of several fungi, genus Polypŏrus, of a leathery appearance, growing on trees. *See* GERMAN TINDER.

**AMAGER** (ám'a-ger). A small Danish island in the Sound, opposite Copenhagen, part of which is situated on it. Pop. 100,000.

**AMAKO'SA.** One of the Kaffir tribes of S. Africa.

**AMALASUN'THA.** Daughter of Theodoric, king of the Ostrogoths, and after his death regent of Italy for her son Athalarich. Athalarich died in 534, after which Amalasuntha married her cousin Theodahad, but retained the power in her own hands. Mainly on this account she was imprisoned and strangled in her bath by order of her second husband, A.D. 535.

**AMAL'EKITES.** An ancient tribe occupying the peninsula between Egypt and Palestine, named after a grandson of Esau. They were denounced by Moses for their hostility to the Israelites during their journey through the wilderness, and they seem to have been all but exterminated by Saul and David. The Kenites seem to have been a branch of the Amalekites.

**AMAL'FI.** A seaport in Southern Italy, on the Gulf of Salerno, 23 miles from Naples, the seat of an archbishop. In the early part of the Middle Ages it was a place of great commercial importance, and it long enjoyed a republican constitution of its own. Quarrels with its neighbours, encroachments of the sea, and other causes led to its downfall, but it is still much visited by tourists. The road from Salerno to Amalfi is a magnificent carriage-way, partly hewn in the cliffs, and affords charming views. Amalfi is surrounded by rocky heights, and its harbour was choked up by a landslip in 1900.

Here arose the **Amalfian Code** of maritime law, composed in 1010 and containing 66 articles, which once had great influence in the maritime affairs of the Mediterranean trading peoples. The MS. was discovered by the Prince of Andorra, in 1844, in the imperial library at Vienna. Pop. 7472.

**AMAL'GAM.** A name applied to the alloys of mercury with the other metals. One of them is the amalgam of mercury with tin, which is used to silver looking-glasses. Mercury unites very readily with gold and silver at ordinary temperatures, and advantage is taken of this to separate them from their ores, the process being called *amalgamation*. The mercury dissolves and combines with the precious metal and separates it from the waste matters, and is itself easily driven off by heat. An amalgam made of cadmium and copper is frequently used in dentistry, and an amalgam of zinc and tin is used for the rubbers of frictional electric machines.

**AMAL'THEA.** In Greek legend the daughter of the King of Crete. She was the nurse of Zeus and fed him on goats' milk, her reward being the horn of the goat, which was called the horn of plenty, as it supplied all her needs.

**AMANA.** Town of Iowa. It is the seat of a religious community called the Community of True Inspiration. This was established in Württemberg in 1714 and its members emigrated to America, settling at Iowa in 1855. It was dissolved in 1932.

**AMANI'TA.** A genus of fungi, one species of which, *A. muscāria*, or fly-agaric, is extremely poisonous.

**AMA'NUS.** A branch of the Taurus Mountains in Asia Minor.

**AMAPALA** (ä-mä-pä'lä). A seaport of Central America, State of Honduras, on a small island.

**AMARA.** Town of Iraq. It stands on the Tigris, 130 miles from Basra on the way to Bagdad. On May 31, 1915, the British attacked the Turks near here and drove them out of their positions. They entered the town on June 4. Pop. 8000.

**AMARANTHA'CEÆ.** The amaranths, a nat. ord. of apetalous plants, chiefly found in tropical countries, where they are often troublesome weeds. They are remarkable for the white or sometimes reddish scales of which their flowers are composed. Amaranthus, the typical genus, comprises *A. caudātus*, or love-lies-bleeding, a common plant in gardens, with pendulous racemes of crimson flowers; and *A. hypochondriacus*, or prince's feather. The blossoms keep their bloom after being plucked and dried (hence the name: Gr. *a*, not, and *narainō*, to wither).

**AMARAPURA** (*a-ma-ra-pū'ra*). A deserted city, once the capital of the Burmese Empire, on the left bank of the Irrawaddy, quite close to Mandalay. In 1810, when the city had about 175,000 inhabitants, it was completely destroyed by fire; in 1839 it was visited by a destructive earthquake. In 1857 the seat of government was removed to Mandalay. Pop. 6500.

**AMARYLLIDA'CEÆ.** An order of monocotyledonous plants, generally bulbous, occasionally with a tall, cylindrical, woody stem (as in Agave); with a highly-coloured flower, six stamens, and an inferior three-celled ovary; natives of Europe and most of the warmer parts of the world. The order includes the snowdrop, the snow-flake, the daffodil, the belladonna-lily (belonging to the typical genus Amaryllis), the so-called Guernsey-lily (probably a native of Japan), the Brunsvigias, the blood-flowers (Hæmanthus) of the Cape of Good Hope, different species of Narcissus, Agave (American aloe), etc. Many are highly prized garden and hot-house plants; the bulbs of some are extremely poisonous.

**AMASIA** (ä-mä-sē'ä). A town in the north of Asia Minor, on the Irmak, 60 miles from the Black Sea, surmounted by a rocky height in which is a ruined fortress; has numerous mosques, richly-endowed Mohammedan schools, and a trade in wine, silk, etc. Amasia was a residence of the ancient kings of Pontus. A few miles from Amasia, on the road leading to Zilleh, is the famous battlefield where Cæsar defeated Pharnaces, King of Pontus, and whence he sent his famous message to Rome: *Veni, vidi, vici.* Pop. 61,000.

**AMA'SIS.** King of Egypt from 569 to 526 B.C., obtained the throne by rebelling against his predecessor and benefactor Apries, and is chiefly known from his friendship for the Greeks, and his wise government of the kingdom, which, under him, was in the most prosperous condition. He was succeeded by his son Psammetik.

**AMATI** (ä-mä'tē). A family, almost a dynasty, of Cremona who manufactured violins in the sixteenth and seventeenth centuries. Andrea (about 1540-1600) was the founder of the business, which was carried on by his sons Geronimo and Antonio, and by Niccolo the son of Geronimo. The first instrument signed Amati bears the date 1546. Most of the violins made by them are of comparatively small size and flat model, and the tone produced by the fourth or G string is somewhat thin and sharp. Many of Niccolo Amati's violins are, however, of a larger size and have all the fullness and intensity of tone characteristic of those manufactured by Stradivario and Guarnerio.

**AMATIT'LAN.** A town in Central America, State of Guatemala, about 15 miles south of the city of Guatemala, a busy modern town, the inhabitants of which are actively engaged in the cochineal trade. There is a small lake of the same name close to the town. Pop. 37,705.

**AMAURO'SIS** (Gr. *amauros*, dark). A species of blindness, formerly called *gutta serena* (the "drop serene," as Milton, whose blindness was of this sort, called it), caused by disease of the nerves of vision. The most frequent causes are a long-continued direction of the eye on minute objects, long exposure to a bright light, to the fire of a forge, to snow, or irritating gases, overfullness of blood, disease of the brain, etc. If taken in time it may be cured or mitigated; but, unless caused by loss of blood, by lead-poisoning, or debility, it is usually incurable.

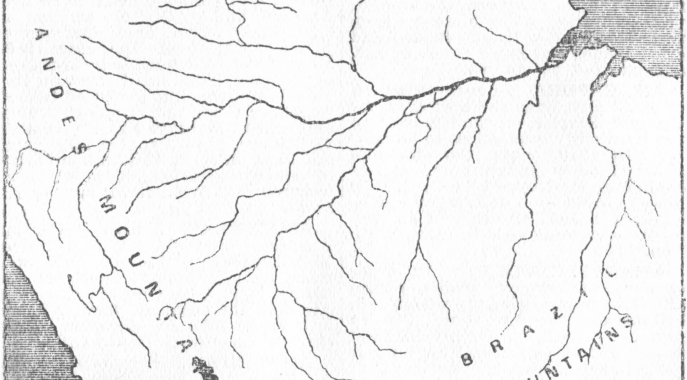
**AMAXICHI** (ä-mäks'ē-hē). The chief town and seaport of Santa Maura (Leukadia), one of the Ionian Isles, the seat of a Greek bishop; manufactures cotton and leather. Pop. 5500.

**AM'AZON, or AM'AZONS.** A river of South America, the largest in the world, formed by a great number of sources which rise in the Andes, the

two head branches being the Tunguragua or Marañon and the Ucayali, both rising in Peru, the former from Lake Lauricocha, in lat. 10° 29′ S., the latter formed by the Apurimac and Urubamba, the headwaters of which are between lat. 14° and 16° S.; general course north of east; length, including windings, 3600 miles; area of drainage basin, 2,722,000 sq. miles. It enters the Atlantic under the equator by a mouth 200 miles wide, divided into two principal and several smaller arms by the large island Marajo and a number of smaller islands.

In its upper course navigation is interrupted by rapids, but from its mouth upwards for a distance of 3300 miles (mostly in Brazil) there is no obstruction. It receives the waters of about 200 tributaries, 100 of which are navigable and seventeen of these 1000 to 2300 miles in length; northern tributaries: Santiago Morona, Pastaça, Tigre, Napo, Putumayo, Japura, Rio Negro (the Cassiquiare connects this stream with the Orinoco), etc.; southern: Huallaga, Ucayali, Javari, Jutay, Jurua, Coary, Purus, Madeira, Tapajos, Xingu, etc. At Tabatinga, where it enters Brazilian territory, the breadth is 1½ miles; below the mouth of the Madeira it is 3 miles wide and where there are islands often as much as 7; from the sea to the Rio Negro, 750 miles in a straight line, the depth is nowhere less than 30 fathoms; up to the junction of the Ucayali there is depth sufficient for the largest vessels. The Amazonian water system affords some 50,000 miles of river suitable for navigation.

The rapidity of the river is considerable, especially during the rainy season (Jan. to June), when it is subject to floods; but there is no great fall in its course. The tides reach up as far as 400 miles from its mouth. The singular phenomenon of the *bore*, or as it is called on the Amazon the *pororoca*, occurs at the mouth of the river at spring-tides on a grand scale.




Map of Amazon Basin

The river swarms with alligators, turtles, and a great variety of fish. The country through which it flows is extremely fertile, and is mostly covered with immense forests; it must at some future time support a numerous population, and be the theatre of a busy commerce. Steamers and other craft ply on the river, the chief centre of trade being Para, at its mouth. The Amazon was discovered by Vicente Yañez Pinzon in 1500, but the stream was not navigated by any European till 1541, when Francis Orellana descended it. Orellana stated that he found on its banks a nation of armed women, and this circumstance gave the name to the river.

**AMAZ'ONAS.** The largest state of Brazil, traversed by the Amazon and its tributaries; area, 731,363 sq. miles. Pop. 433,777.

**AM'AZONS.** According to an ancient Greek tradition, the name of a community of women, who permitted no men to reside among them, fought under the conduct of a queen, and long constituted a formidable State. They were said to burn off the right breast that it might not impede them in the use of the bow—a legend that arose from the Greeks supposing the name was from *a*, not, *mazos*, breast. It is probably from *a*, together, and *mazos*, breast, the name meaning therefore sisters. Several nations of Amazons are mentioned, the most famous being those who dwelt in Pontus, who built Ephesus and other cities. Their queen, Hippolyta, was vanquished by Hercules, who took from her the girdle of Mars. They attacked Attica in the time of Theseus. They came to the assistance of Troy under their queen, Penthesilēa, who was slain by Achilles.

**AMAZU'LU.** A branch of the Zulu Kaffir race.

**AMBA'LA, or UMBALL'A.** A town of India, in the Punjab, in an open plain 3 miles from the Ghaggar, consisting of an old and a new portion, with a flourishing trade in grain and other commodities. The military cantonment is several miles distant. It is an important railway junction. Pop. 76,326.

**AMBALE'MA.** A town of S. America, Colombia, on the Magdalena; the centre of an important tobacco district. Pop. 6285.

**AM'BAREE.** A fibre similar to jute largely used in India, obtained from *Hibiscus cannabinus*.

**AMBARVALIA.** An ancient Roman festival held annually in May, and celebrated by the Arval Brothers (Fratres Arvales). Its object was to preserve the growing crops from harm of any kind.

**AMBAS'SADOR.** A minister of the highest rank, employed by one prince or State at the Court of another to manage the public concerns, or support the interests of his own prince or State, and representing the power and dignity of his sovereign or State.

Ambassadors are *ordinary* when they reside permanently at a foreign Court, or *extraordinary* when they are sent on a special occasion. When *ambassadors extraordinary* have full powers, as of concluding peace, making treaties, and the like, they are called *plenipotentiaries*. Ambassadors are often called simply *ministers*. *Envoys* are ministers employed on special occasions, and are of less dignity than ambassadors. The term *ambassador*, however, is also used in a more general sense for any diplomatic agent or minister. An ambassador and his suite are not amenable to the laws of the country in which they are residing. *See* DIPLOMACY.

**AM'BATCH** (*Herminiēra elaphroxylon*). A thorny leguminous shrub with yellow flowers growing in the shallows of the Upper Nile and other rivers of tropical Africa, 15 to 20 feet high. Its wood is extremely light and spongy, and hence is made into floats or rafts. A raft capable of bearing eight persons can easily be carried by one.

**AMBA'TO.** A town of Ecuador, on the side of Chimborazo, 70 miles south of Quito. Pop. 25,000.

**AM'BER.** A semi-mineral substance of resinous composition, a sort of fossil resin, the produce of extinct Coniferæ, used for the manufacture of ornamental objects. It is usually of yellow or reddish-brown colour; brittle; yields easily to the knife; is translucent, and possessed of a resinous lustre. Specific gravity, 1.065. It burns with a yellow flame, emitting a pungent aromatic smoke, and leaving a light carbonaceous residue, which is employed as the basis of the finest black varnishes. By friction it becomes strongly electric.

It is found in masses from the size of coarse sand to that of a man's head, and occurs in beds of bituminous wood situated upon the shores of the Baltic and Adriatic Seas; also in Poland, France, Italy, and Denmark. It is often washed up on the Prussian shores of the Baltic, and is also obtained by fishing for it with nets. Sometimes it is found on the east coast of Britain, in gravel pits round London, also in the United States.

**AM'BERG.** A town of South Germany, in Bavaria, on the Vils, well built, with a Gothic church of the fifteenth century, royal palace, town house, etc.; it manufactures ironwares, stone-ware, tobacco, beer, vinegar, and arms. Pop. 26,330.

**AM'BERGRIS.** A substance derived from the intestines of the sperm-whale, and found floating or on the shore; yellowish or blackish white; very light; melts at 140°, and is entirely dissipated on red-hot coals; is soluble in ether, volatile oils, and partially in alcohol, and is

chiefly composed of a peculiar fatty substance. Its odour is very agreeable, and hence it is used as a perfume.

**AMBLE.** A town (urban district) of England, Northumberland, near the mouth of the River Coquet, with a harbour at which coal is exported, fishing also being carried on. Pop. 4208.

**AMBLESIDE.** An old market town of England, Westmorland, near the head of Windermere, a great tourist centre. Pop. (1931), 2343.

**AMBLETEUSE** (ȧn-bl-*teuz*). A small seaport of France, 6 miles from Boulogne. After the capture of Boulogne in 1544 the English began to construct a military harbour here under the name of New Haven, but had to abandon the enterprise in 1554. Here James II. landed on Christmas Day, 1688, after his flight from England; and from its harbour Napoleon I. prepared to dispatch a flotilla of flat-bottomed boats for the invasion of Britain.

**AMBLYOP'SIS.** A genus of blind fishes, containing only one species, *A. spelæus*, found in the Mammoth Cave of Kentucky.

**AM'BLYOPY.** Dullness or obscurity of eyesight without any apparent defect in the organs; the first stage of amaurosis.

**AM'BO,** or **AM'BON.** In early Christian churches a kind of raised desk or pulpit, sometimes richly ornamented, from which certain parts of the service were read, or discourses delivered, there being sometimes two in one church. Some of the most ancient of these pulpits are at Salonica (fourth century) and at Ravenna (fifth and sixth centuries). The ambo constructed by Justinian in the Church of St. Sophia was destroyed by an earthquake.

**AMBOINA.** *See* AMBOYNA.

**AMBOISE** (ȧn-bwäz). A town of France, department Indre-et-Loire, 12 miles east of Tours, on the Loire, with an antique castle, the residence of several French kings, and manufactures of files and rasps. Near the Château d'Amboise is that of Cloux, which was given by Francis I. to Leonardo da Vinci, and where the artist died in 1519. Pop. 4660.

**AMBOY'NA, AMBOINA,** or **APON.** One of the Molucca Islands in the Indian Archipelago, close to the large island of Ceram; area, about 386 sq. miles. Here is the seat of government of the Dutch residency or province of Amboyna, which includes also Ceram, Buru, etc. Its surface is generally hilly or mountainous, its general aspect beautiful, and its climate on the whole salubrious, but frequently visited by earthquakes. It affords a variety of useful trees, including the coconut and sago palms. Cloves and nutmegs are the staple productions. The soil in the valleys and along the shores is very fertile, but a large portion remains uncultivated. The natives are mostly of Malayan race.

The capital, also called **Amboyna,** is situated on the Bay of Amboyna, and is well built and defended by a citadel. The streets are planted on each side with rows of fruit-trees. It is a free port. Pop. 11,726.

**History.** In 1607 Amboyna and the other Moluccas were taken by the Dutch from the Portuguese, and it was for some years the seat of government of the Dutch East Indies. Trade with the Moluccas was secured to the British by treaty in 1619, but the British establishment was destroyed and several persons massacred in 1623, an outrage for which no satisfaction was obtained till Cromwell obtained it in 1654. Amboyna was taken by the British in 1796 and 1810, but each time restored to the Dutch. Pop. 67,593. The Dutch residency of Amboyna, including the Banda group, Ceram, Buru, and other islands, has an area of 17,372 sq. miles and a population of about 358,250.

**AMBOYNA WOOD.** A beautiful curled orange or brownish coloured wood brought from the Moluccas, yielded by *Pterospermum indicum*.

**AMBRA'CIA.** *See* ARTA.

**AMBRINE.** A preparation of paraffin, resin, and wax, used as a remedy in the treatment of burns and scalds and in rheumatic disorders. It was discovered by Barthe de Sandford, a French doctor, in 1904.

**AM'BROSE, Saint.** A celebrated father of the Church; born in A.D. 333 or 334, probably at Trèves, where his father was prefect; died in 397. He was educated at Rome, studied law, practised as a pleader at Milan, and in 369 was appointed governor of Liguria and Æmilia (North Italy). His kindness and wisdom gained him the esteem and love of the people, and in 374 he was unanimously called to the bishopric of Milan, though not yet baptized. For a time he refused to accept this dignity, but he had to give way, and at once ranged himself against the Arians. In his struggles against the Arian heresy he was opposed by Justina, mother of Valentinian II., and for a time by the young emperor himself, together with the courtiers and the Gothic troops. Backed by the

people of Milan, however, he felt strong enough to deny the Arians the use of a single church in the city, although Justina, in her son's name, demanded that two should be given up.

He had also to carry on a war with paganism, Symmachus, the prefect of the city, an eloquent orator, having endeavoured to restore the worship of heathen deities. In 390, on account of the ruthless massacres at Thessalonica ordered by the emperor Theodosius, he refused him entrance into the church of Milan for eight months. The later years of his life were devoted to the more immediate care of his see. His writings, which are numerous, show that his theological knowledge extended little beyond an acquaintance with the works of the Greek fathers. He wrote Latin hymns, but the *Te Deum Laudamas*, which has been ascribed to him, was written a century later. He introduced the **Ambrosian Chant,** a mode of singing more monotonous than the Gregorian, which superseded it. He also compiled a form of ritual known by his name. The best edition of his works is that published in Paris, 1686-90, in 2 vols. fol., and reissued at Lyons in 1853.

**AMBRO'SIA.** In Greek mythology the food of the gods, as nectar was their drink.

**AMBROSIAN CHANT.** *See* AMBROSE.

**AMBROSIAN LIBRARY.** A public library in Milan founded by the cardinal archbishop Federigo Borromeo, a relation of St. Charles Borromeo, who sent scholars, among them Antonio Olgiati, all over Europe to acquire books. The library was opened in 1609, now containing 230,000 printed books and many MSS., among the latter being the famous collection of Pinelli. It was named in honour of St. Ambrose, the patron saint of Milan.

**AM'BRY.** A niche or recess in the wall of ancient churches near the altar, fitted with a door and used for keeping the sacred utensils, etc.

**AMBULA'CRAL SYSTEM.** The locomotive apparatus of the Echinodermata (sea-urchins, star-fishes, etc.), the most important feature of which is the protrusible tube-feet that the animal can at will dilate with water and thus move forward.

**AMBULANCE.** Vehicle, or other conveyance, used for removing sick and injured persons. In London and other cities and towns ambulances are provided by local authorities, and can be quickly summoned in case of accident. A nurse is in attendance, and the vehicle contains material for emergency treatment. The London County Council maintain a very large service, which, in 1929, answered over 43,000 calls. Ambulances are also provided to carry persons suffering from infectious diseases to hospitals.

**AM'BULANCE (Field).** A military medical unit attached to an army in the field for the purpose of providing medical and surgical first-aid to sick and wounded immediately behind the fighting-line. The term field-ambulance was adopted in the British service in 1905-6.

The chief and most important duty of a field-ambulance is to relieve fighting troops of their sick and wounded and transfer them to the rear to the collecting-hospitals, known as Casualty Clearing Stations situated at the head of the line of communications to the army's base. Three field-ambulances are attached to each division in the field, one to each brigade, and their officers and men are divided into bearer and nursing sections and equipped with horse or mule and motor transport for wounded and sick. In the East sick and wounded are often carried in litters on camel-back, two of the cacolets being balanced against each other.

A medical ambulance is theoretically able to undertake any hospital work, but in practice it confines itself when in action with its division to clearing the front line, and when at rest to treating the minor maladies such as lice, scabies, and slight illnesses which do not require much time or equipment. The medical and surgical outfit of an ambulance is carried in panniers and is usually in excess of its requirements.—BIBLIOGRAPHY: M. M. Bird, *The Errand of Mercy*: *a History of Ambulance Work upon the Battlefield*; G. H. Painton, *The Field Ambulance Guide*.

**AMELAN'CHIER** (-kē-ēr). A genus of small trees natives of Europe and N. America, allied to the medlar. *A. Vulgāris*, long cultivated in English gardens, has showy white flowers; *A. Botryāpium* (grape-pear) and *A. ovālis*, American species, yield pleasant fruits.

**AMELAND** (ä'me-länt). An island off the north coast of Holland, 13 miles long and 3 broad; flat; inhabitants (about 3000 in number) chiefly engaged in fishing and agriculture.

**AMÉLIE-LES-BAINS** (ä-mā-lē-lā-baŋ). A village of France, department Pyrénées-Orientales, frequented as a winter residence for invalids, and for its warm sulphureous springs.

The place was known to the Romans, as has been proved by the discovery of Roman medals there.

**AMEN** (ā-men'). A Hebrew word, signifying "verily" "truly," transferred from the religious language of the Jews to that of the Christians, and used at the end of prayers as equivalent to "so be it," "may this be granted."

**AMEND'MENT.** A proposal brought forward in a meeting of some public or other body, either in order to get an alteration introduced into some proposal already before the meeting, or entirely to overturn such proposal. In Parliament an amendment denotes an alteration made in the original draft of a Bill whilst it is passing through the houses. Amendments may be made so as totally to alter the nature of the proposition; and this is a way of getting rid of a proposition, by making it bear a sense different from what was intended by the movers, who are thus compelled to abandon it.

**AMENO'PHIS** (or **AMENHOTEP**) **III.** A king of ancient Egypt about 1500 B.C.; warred successfully against Syrians and Ethiopians; built magnificent temples and palaces at Thebes, where the so-called Memnon statue is a statue of this king. He was the only Egyptian king deified during his lifetime.

**AMENORRHŒ'A.** Absence or suspension of menstruation. The former may arise from general debility or from defective development, the latter from exposure to cold, from attacks of fever or other ailment, violent excitement, etc.

**AMEN-RA.** Egyptian god also called Ammon. He was originally worshipped at Thebes, but gradually his cult spread to other parts of the land. He came in time to be the principal god of the Egyptians and the attributes of the god Ra, the sun god, and other gods were given to him. He was regarded as the creator of the universe. Amen-Ra is represented in art either with the head of a ram, or as a human being with two lofty feathers on his head.

**AMENTA'CEÆ.** An order of plants having their flowers arranged in amenta or catkins; now broken up into several orders, the chief of which are Betulaceæ (the birch), Salicaceæ (the willow), Fagaceæ (the beech), Juglandaceæ (the walnut), and Myricaceæ (bog-myrtle).

**AMENTI.** The lower regions in the Egyptian religion through which souls passed to their homes in the land of happiness. Osiris was lord of this region and the souls of the dead were weighed in his presence.

**AMEN'TIA.** Imbecility from birth, especially when extreme; idiocy.

**AMEN'TUM.** In botany, that kind of inflorescence which is commonly known as a catkin (as in the

Amentum
Hazel (*Corylus Avellana*) showing Catkins and Nuts

birch or willow), consisting of unisexual apetalous flowers in the axil of scales or bracts.

**AMER'ICA,** or the **NEW WORLD.** The largest of the great divisions of the globe except Asia, is washed on the west by the Pacific, on the east by the Atlantic, on the north by the Arctic Ocean, while on the south it tapers to a point. On the northwest it approaches within about 50 miles of Asia, while on the northeast the island of Greenland approaches within 370 miles of the European island Iceland; but in the south the distance between the American mainland and Europe or Africa is very great. Extreme points of the continent—north, Boothia Felix, at the Strait of Bellot, lat. 72° N.; south, Cape Horn, lat. 56° S.; west, Cape Prince of Wales, long. 168° W.; east, Point de Guia, long. 35° W.

America as a whole forms the two triangular continents of North and South America, united by the narrow Isthmus of Panama; and having an entire length of about 9500 miles; a maximum breadth (in North America) of 3300 miles; a coast-line of 44,000 miles; and a total area, including the islands, of over 16,000,000, of which N. America

North and South America

ontains about 8,000,000 sq. miles. outh America is more compact in rm than N. America, in this respect sembling Africa, while N. America ore resembles Europe. Between e two on the east side is the great asin which comprises the Gulf of exico, the Caribbean Sea, and the est India Islands. Like Europe also N. America possesses numerous islands, while those of S. America are less important and confined almost to the southern extremity.

**Mountains.** Three-fourths of the area of America is comparatively flat, and this portion of the surface is bounded on the west by lofty mountain systems which stretch con-

tinuously from north to south between the extremities of the continent, generally at no great distance from the west shore. In North America the Rocky Mountains, a broad series of masses partly consisting of plateaux, form the most important portion of the elevated surface, being continued southward in the mountains and tableland of Mexico and the ranges of Central America. Separated by depressions from the Rocky Mountains proper, and running close to and parallel with the western coast, are several lofty ranges (Sierra Nevada, Cascade Mountains, etc.). Near the eastern coast, and forming an isolated mass, are the Appalachians, a system of much inferior magnitude.

The loftiest mountains in N. America are M'Kinley (20,300 feet), in Alaska; Logan (19,539 feet), in N. W. Canada; and Popocatepetl (17,540 feet). The depression of the Isthmus of Panama (about 260 feet) forms a natural separation between the systems of the north and the south. In S. America the Andes form a system of greater elevation but less breadth than the Rocky Mountains, and consist of a series of ranges (*cordilleras*) closely following the line of the west coast from the Isthmus of Panama to Cape Horn. The highest summits are Aconcagua (23,025 feet), Sorata or Illampu (25,248), and Sahama (21,480). Volcanoes are numerous. Isolated mountain groups of minor importance are the highlands of Venezuela and of Brazil, the latter near the eastern coast, reaching a height of 10,000 feet.

The fertile lowlands which lie to the east of the Rocky Mountains and the Andes form a depression extending through both continents from the northern to the southern oceans. They have somewhat different features and different names in different portions; in N. America are *prairies* and *savannahs*, in S. America *llanos*, *selvas*, and *pampas*.

**Rivers and Lakes.** Through these low grounds flow the numerous great rivers which form so characteristic a feature of America. The principal are the Mackenzie, Coppermine, and Great Fish Rivers, entering the Northern Ocean; the Churchill, Nelson, Severn, and Albany, entering Hudson's Bay; the St. Lawrence, entering the Atlantic; Mississippi and Rio del Norte, entering the Gulf of Mexico (all these being in N. America); the Magdalena, Orinoco, Amazon, Paranahiba, Rio de la Plata, Colorado, and Rio Negro, entering the Atlantic (all in S. America); and the Yukon, Fraser, Colombia, San Joaquin, Sacramento, and Colorado, entering the Pacific. The rivers which flow into the Pacific, however, owing to the fact that the great backbone of the continent, the Rocky Mountains and the Andes, lies so near the west coast, are of comparatively little importance, in S. America being all quite small. Sometimes rivers traversing the same plains, and nearly on the same levels, open communications with each other, a remarkable instance being the Cassiquiare in S. America, which, branching off from the Rio Negro and joining the Orinoco, forms a kind of natural canal, uniting the basins of the Orinoco and the Amazon. The Amazon or Marañon in S. America, the largest river in the world, has a course of about 3600 miles, and a drainage basin of 2,722,000 sq. miles; the Mississippi-Missouri, the largest river of North America, runs a longer course than the Amazon, but the area of its basin is not nearly so great. North America has the most extensive group of lakes in the world—Lakes Superior, Michigan, Huron, Erie, and Ontario, which through the St. Lawrence send their drainage to the Atlantic. Thus by means of lakes and rivers the interior of both N. and S. America is opened up and made accessible.

**Climate.** In regard to climate N. America naturally differs very much from S. America, and has more resemblance to the continents of Europe and Asia (regarded as a whole). In N. America, as in the older continent, the eastern parts are colder than the western, and hence the towns on the Atlantic coast have a winter temperature about 10° lower than those in corresponding latitudes of Europe. The winter temperature of the greater part of N. America is indeed severe, though the intense cold is less felt on account of the dryness of the air. There is no regular season of rainfall unless in the south. Although two-thirds of S. America lies within the tropics the heat is not so great as might be expected, owing to the prevailing winds, the influences of the Andes, and other causes. The highest temperature experienced is probably not more than 100° in the shade; at Rio de Janeiro the mean is about 74°, at Lima 72°. Over a great part of S. America there is a wet and a dry season, varying in different regions; on the upper Amazon the rains last for ten months, being caused by the prevailing easterly winds bringing moisture from the Atlantic, which is condensed on the eastern slopes of the Andes. In each of the Americas there is a region in which little or no rain falls: in N

America it extends over a part of the United States and Northern Mexico, in S. America over a part of the coast region of Peru and Chile.

**Minerals.** America is rich in valuable minerals. It has supplied the world with immense quantities of gold and silver, which it still yields in no small amount, especially in the United States. It possesses inexhaustible stores of coal (United States), with iron, copper, lead, tin, mercury, etc. Petroleum may be called one of its specialities, its petroleum wells having caused whole towns to spring into existence. Diamonds and other precious stones are found.

**Vegetation.** As regards vegetation America may be called a region of forests and verdure, vast tracts being covered by the grassy prairies, llanos, and pampas where the forests fail. In N. America the forests have been largely made use of by man; in S. America vast areas are covered with forests, which as yet are traversed only by the uncivilized Indian. In the north is the region of pines and firs; farther south come the deciduous trees, as the oak, beech, maple, elm, chestnut, etc. Then follow the evergreen forests of the tropical regions. The useful timber trees are very numerous; among the most characteristic of America are maghogany and other ornamental woods, and various dyewoods. In the tropical parts are numerous palms, cacti in great variety, and various species of the agave or American aloe. In the virgin forests of S. America the trees are often bound together into an impenetrable mass of vegetation by various kinds of climbing and twining plants. Among useful plants belonging to the American continent are maize, the potato, cacao, tobacco, cinchona, vanilla, Paraguay tea, etc. The most important plants introduced are wheat, rice, and other grains, sugar-cane, coffee, and cotton, with various fruits and vegetables. The vine is native to the continent, and both the American and introduced varieties are now largely cultivated.

**Animals.** The animals of America include, among carnivora, the jaguar or American tiger, found only in S. America; the puma or American lion, found mostly in S. America; the grizzly bear of N. America, fully as powerful an animal as either; the black bear, the skunk, the racoon, the American or prairie wolf, several species of foxes, etc. The rodents are represented by the beaver, the porcupine, and squirrels of several species; the marsupials by the opossum. Among ruminants are the bison, or, as it is commonly called, the buffalo, the moose or elk, the Virginian stag, the musk-ox; and in S. America the llama (which takes the place of the camel of the Old World), the alpaca, and the vicuña.

Other animals most distinctive of S. America are sloths, fitted to live only in its dense and boundless forests; ant-eaters and armadillos; monkeys with prehensile tails, in this and other respects differing from those of the Old World; the condor among the heights of the Andes, the nandu, rhea or three-toed ostrich, beautiful parrots and hummingbirds. Among American reptiles are the boa-constrictor, the rattlesnake, the alligator or cayman, the iguana and other large lizards, large frogs and toads. The domestic animals of America, horses, cattle, and sheep, are of foreign origin. The electrical eel exists in the tropical waters.

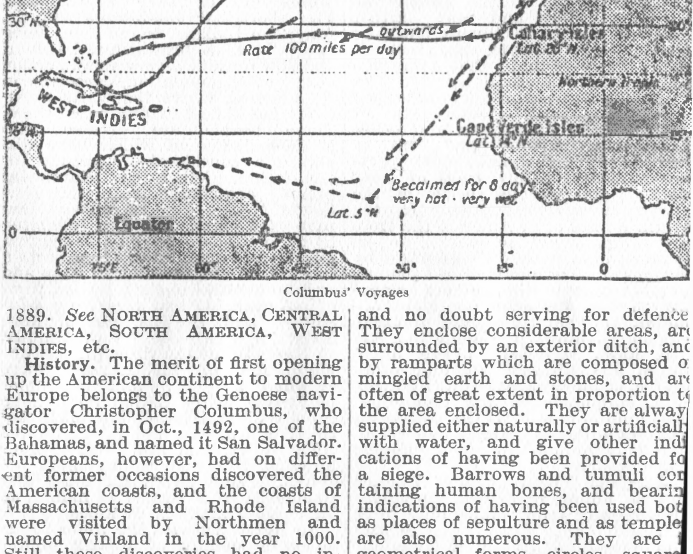
**Population.** The population of America consists partly of an aboriginal race or races, partly of immigrants or their descendants. The aboriginal inhabitants are the American Indians, or red men, being generally of a brownish-red colour, and now forming a very small portion of the total population, especially in N. America, where the white population has almost exterminated them. These people are divided into branches, some of which have displayed a considerable aptitude for civilization. When the Europeans became acquainted with the New World, Mexico, Central America, and part of S. America were inhabited by populations which had made great advances in many things that pertain to civilized life, dwelling in large and well-built cities under a settled form of government, and practising agriculture and the mechanical arts. Ever since the discovery of America at the close of the fifteenth century Europeans of all nations have crowded into it; and the comparatively feeble native races have rapidly diminished, or lost their distinctive features by intermixtures with whites, and also with negroes brought from Africa to work as slaves. These mixed races are distinguished by a variety of names, as Mestizos, Mulattoes, Zambos, etc.

In North America the white population is mainly of British origin, though to a considerable extent it also consists of Germans, Scandinavians, etc., and the descendants of such. In Central and South America the prevailing white nationality is the Spanish and Portuguese. In the extreme north are the Eskimos—a scattered and

stunted race closely allied to some of the peoples of Northern Asia. That the aboriginal inhabitants of America passed over from Asia is tolerably certain, but when and from what part we do not know. The total population of the New World is estimated at 210,000,000, of which perhaps 145,000,000 are whites, 30,000,000 mixed races, 23,000,000 negroes, and 12,000,000 Indians. As regards religion, the bulk of the population of N. America is Protestant; of Central and S. America the religion is almost exclusively Roman Catholic. Several millions of the Indians are heathens.—The independent States of America are all republican in form of government, Brazil having become a republic in 1889. *See* NORTH AMERICA, CENTRAL AMERICA, SOUTH AMERICA, WEST INDIES, etc.

**History.** The merit of first opening up the American continent to modern Europe belongs to the Genoese navigator Christopher Columbus, who discovered, in Oct., 1492, one of the Bahamas, and named it San Salvador. Europeans, however, had on different former occasions discovered the American coasts, and the coasts of Massachusetts and Rhode Island were visited by Northmen and named Vinland in the year 1000. Still these discoveries had no influence on the enterprise of Columbus, and cannot detract in the least from his merit; they were forgotten, and had never been made known to the inhabitants of the rest of Europe. Though Columbus was the first of his time who set foot in the New World, it has taken its name not from him, but from Amerigo Vespucci. The mainland was first seen in 1497 by Sebastian Cabot, who sailed under the patronage of Henry VII. of England. For further historical particulars, see articles on various republics, colonies, etc.

The known history of America hardly goes beyond the period of its discovery by Columbus; but it possesses many monuments of antiquity that might take us many centuries backward, could we learn anything of their origin or of those by whom they were produced. Among such antiquities are great earthworks in the form of mounds, or of raised enclosures, crowning the tops of hills, river peninsulas, etc., and no doubt serving for defence. They enclose considerable areas, are surrounded by an exterior ditch, and by ramparts which are composed o mingled earth and stones, and are often of great extent in proportion to the area enclosed. They are always supplied either naturally or artificially with water, and give other indications of having been provided fo a siege. Barrows and tumuli containing human bones, and bearing indications of having been used both as places of sepulture and as temples are also numerous. They are geometrical forms—circles, squares, parallelograms, etc. A mound on the plain of Cahokia in Illinois, opposite the city of St. Louis, is 700 feet long 500 feet broad, and 90 feet high. Earth mounds of another class represent gigantic animal forms in bas-relief on the ground. One is




Columbus' Voyages

man with two heads, the body 50 feet long and 25 feet broad across the breast; another represents a serpent 1000 feet in length, with graceful curves.

The monuments of Mexico, Central America, and Peru are of a more advanced state of civilization, approach nearer to the historical period, and make the loss of authentic information more keenly felt. Here there are numerous ruined towns with most elaborate sculptures, lofty pyramidal structures serving as temples or forts, statues, picture writing, hieroglyphics, roads, aqueducts, bridges, etc. Some remarkable prehistoric remains discovered in recent years are what are known as the abodes of the "cliff-dwellers." These consist of habitations constructed on terraces and in caves high up on the steep sides of cañons in Colorado and other parts of the western states of N. America. Some of these buildings are several stories high. *See also* MEXICO, PERU, etc.—BIBLIOGRAPHY: L. Farrand, *The American Nation*; Prescott, *The Conquest of Mexico* and *The Conquest of Peru*; Winsor, *Narrative and Critical History of America*; F. W. Halsey, *Great Epochs in American History* (1vols.).

**AMERICAN INDIANS.** *See* INDIANS.

**AMERICANISM.** A term, phrase, or idiom peculiar to the English language as spoken in America, and not forming part of the language as spoken in England. The following is a list of a few of the more noteworthy Americanisms, some of them being rather slangy or vulgar.

*Approbate*, to approve.
*Around* or *round*, about or near. To *hang around* is to loiter about a place.
*Backwoods*, the partially-cleared forest regions in the western States.
*Bee*, an assemblage of persons to unite their labours for the benefit of an individual, or family, or to carry out a joint scheme.
*Boss*, an employer or superintendent of labourers, a leader.
*Bug*, a coleopterous insect, or what in England is called a *beetle*.
*Buggy*, a four-wheeled vehicle.
*Bulldose*, to; to intimidate voters.
*Bunkum* or *buncombe*, a speech made solely to please a constituency; talk for talking's sake, and in an inflated style.
*Bureau*, a chest of drawers, a dressing-table surmounted by a mirror.
*Calculate*, to suppose, to believe, to think.
*Camp-meeting*, a meeting held in the fields or woods for religious purposes, and where the assemblage encamps and remains several days.
*Cane-brake*, a thicket of canes.
*Car*, a carriage or wagon of a railway train. The Englishman "travels by rail" or "takes the train"; the American takes or goes by the *cars*.
*Carpet-bagger*, a needy political adventurer who carries all his worldly goods in a carpet-bag.
*Caucus*, a private meeting of the leading politicians of a party to agree upon the plans to be pursued in an approaching election.
*Chalk*, a *long chalk* means a great distance, a good deal.
*Clever*, good-natured, obliging.
*Cocktail*, a stimulating drink made of brandy or gin mixed with bitters, sugar, and water.
*Corn*, maize (in England it means wheat, or grain in general).
*Corn-husking*, or *corn-shucking*, an occasion on which a farmer invites his neighbours to assist him in stripping the husks from his Indian corn.
*Cow-hide*, a whip made of twisted strips of raw hide.
*Creek*, a small river or brook; not, as in England, a small arm of the sea.
*Cunning*, small and pretty, nice, e.g. "It was such a *cunning* baby."
*Dander*, to get one's *dander raised*, to have one's *dander up*, is to have been worked into a passion.
*Dead-heads*, people who have free admission to entertainments, or who have the use of public conveyances, or the like, free of charge.
*Depot*, a railway station.
*Down east*, in or into the New England States. A *down-easter* is a New Englander.
*Drummer*, a bagman or commercial traveller.
*Dry goods*, a general term for such articles as are sold by linen-drapers, haberdashers, hosiers, etc.
*Dutch*, the German language.—*Dutchman*, a German.
*Fix*, to; to put in order, to prepare, to adjust. To fix the hair, the table, the fire, is to dress the hair, lay the table, make up the fire.
*Fixings*, arrangements, dress, embellishments, luggage, furniture, garnishings of any kind.
*Gerrymander*, to arrange political divisions so that in an election one party may obtain an advantage over its opponent, even though the latter may possess a majority of votes in the State; from the deviser of such a scheme, named *Gerry*, governor of Massachusetts.
*Given name*, a Christian name.
*Guess*, to; to believe, to suppose, to think, to fancy; also used emphatically, as "Joe, will you liquor up?" "I guess I will."
*Gulch*, a deep abrupt ravine, caused by the action of water.
*Happen in*, to; to happen to come in or call.
*Help*, a servant.
*High-falutin*, inflated speech, bombast.
*Hoe-cake*, a cake of Indian meal baked on a hoe or before the fire.
*Indian summer*, the short season of pleasant weather usually occurring about the middle of November.
*Johnny Cake*, a cake made of Indian corn meal mixed with milk or water and sometimes a little stewed pumpkin; the term is also applied to a New Englander.
*Julep*, a drink composed of brandy or whisky with sugar, pounded ice, and some sprigs of mint.
*Log-rolling*, the assembly of several parties of wood-cutters to help one of them in rolling their logs to the river after they are felled and trimmed; also employed in politics to signify a like system of mutual co-operation.
*Lot*, a piece or division of land, an allotment.
*Lumber*, timber sawed and split for use; as beams, joists, planks, staves, hoops, etc.
*Lynch law*, an irregular species of justice executed by the populace or a mob, without legal authority or trial.
*Mail letters*, to; to post letters.
*Make tracks*, to; to run away.
*Mitten*: to *get the mitten* is to meet with a refusal.
*Mizzle*, to; to abscond, or run away.
*Mush*, a kind of hasty-pudding.
*Muss*, a state of confusion.
*Notions*, a term applied to every variety of smallwares.
*One-horse*: a one-horse thing is a thing of no value or importance, a mean and trifling thing.
*Picaninny*, a negro child.
*Pile*, a quantity of money.
*Planks*, in a political sense, are the several principles which appertain to a party; *platform* is the collection of such principles.
*Reckon* to; to suppose, to think.
*Rock*, a stone of any size; a pebble; as to throw *rocks* at a dog.
*Scallawag*, a scamp, a scapegrace.

*Shanty*, a mean structure such as squatters erect; a temporary hut.
*Skedaddle*, to; to run away; a word introduced during the civil war.
*Smart*, often used in the sense of considerable, a good deal, as a *smart chance*.
*Soft sawder*, flattering, coaxing talk.
*Span* of horses, two horses as nearly as possible alike, harnessed side by side.
*Spread-eagle style*, a compound of exaggeration, bombast, mixed metaphor, etc.
*Store*, a shop, as a book *store*, a grocery *store*.
*Strike oil*, to; to come upon petroleum: hence to make a lucky hit, especially financially.
*Stump speech*, a bombastic speech calculated to please the popular ear, such speeches in newly-settled districts being often delivered from stumps of trees.
*Sun-up*, sunrise.
*Tall*, great, fine (used by Shakespeare much in the same sense); *tall talk* is extravagant talk.
*Ticket*: to vote the *straight ticket* is to vote for all the men or measures your party wishes.
*Truck*, the small produce of gardens; *truck patch*, a plot in which the smaller fruits and vegetables are raised.
*Ugly*, ill-tempered, vicious.
*Vamose*, to; to run off (from the Sp. *vamos*, let us go).

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**AMERICAN JUTE.** *See* ABUTILON.

**AMERICAN ORGAN.** *See* ORGAN.

**AMERICA'S CUP.** International yacht race. It originated in 1851 when a cup, the Queen's Cup, was offered by the Royal Yacht Squadron. An American yacht, the America, won it and since then it has been known as the America Cup, and the race has been sailed in American waters. It has never been won by an English yacht, although the Earl of Dunraven and later Sir Thomas Lipton built several boats that competed for it. Sir Thomas Lipton built five *Shamrocks*, as they were called, and *Shamrock V.* competed in 1930.

**AMER'ICUS.** A town of the United States, Georgia, in a good cotton and corn district. Pop. 11,000.

**AMERIGO VESPUCCI** (ȧ-mer-ē'go vespu̧t'chē). A maritime discoverer, after whom America has been named, born, 1451, at Florence; died, 1512, at Seville. In 1499 he coasted along the continent of America for several hundred leagues, and the publication of his narrative, while the prior discovery of Columbus was yet comparatively a secret, led to the giving of his name to the new continent.

**AMERONGEN.** A village in Holland. Here, at the château belonging to Count Goddard Bentinck, the ex-Kaiser Wilhelm II. took up his residence after signing his letters of abdication at Spa on 9th Nov., 1918.

**AMERSFOORT** (ä'merz-fōrt). A town in Holland, province of Utrecht, communicating by the Eem with the Zuider Zee; manufactures woollen goods, tobacco, glass, and silk yarn. Pop. 38,551.

**AMERSHAM.** Market town of Buckinghamshire, 25¾ miles from London. Brewing and chair-making are the chief industries. Pop. 4221.

**AMERY, Leopold Charles Maurice Stennett.** English politician born in India Nov. 22, 1873, and educated at Harrow and Balliol College, Oxford. He became a fellow of All Souls' College and went to South Africa in 1899 to represent *The Times*. He edited the *Times History of the War* and then turned to politics. He stood for Parliament more than once as a strong tariff reformer. He went to the Front during the Great War and then did confidential work in London and Paris. He was made Under-Secretary for the Colonies in 1919 and in 1921 Parliamentary Secretary to the Admiralty. In 1922-24 he was First Lord of the Admiralty and Secretary for the Colonies and Dominions in the Unionist ministry of 1924-29. Among his works are *The Empire in the New Era* (1928); *Empire and Prosperity* (1930).

**AMES, Fisher.** American statesman, born 1758, died 1808; studied law, and became prominent in his profession—distinguished as a political orator and essayist.

**AMES, Joseph.** English antiquary, born at Yarmouth, 1689, died 1759. He became a ship-chandler at Wapping, devoted himself to antiquarian pursuits, and was for many years secretary to the Society of Antiquaries. His chief publication is, *Typographical Antiquities: being an historical account of Printing in England* (1749).

**AMESBURY.** Town of Wiltshire. It stands on the edge of Salisbury Plain, 8 miles from Salisbury, and from it Stonehenge can easily be visited.

**AMETAB'OLA** (Gr. *ametabolos*, unchangeable). A division of insects, including only the apterous or wingless insects, as lice, spring-tails, etc., which do not undergo any metamorphosis, but which escape from the egg nearly under the same form which they preserve through life.

**AM'ETHYST.** A violet-blue or purple variety of quartz, generally occurring crystallized in hexahedral prisms or pyramids, also in rolled fragments, composed of imperfect prismatic crystals. It is wrought into various articles of jewellery. Th

**oriental amethyst** is a rare violet-coloured gem, a variety of alumina or corundum, of much brilliance and beauty. The name is generally said to be of Greek origin, and expresses some supposed quality in the stone of preventing or curing intoxication. The gem was one of the twelve stones in the breastplate of the Jewish high-priest.

**AMHARA** (ăm-hä'rä). A district of Abyssinia, lying between the Tacazzé and the Blue Nile, but of which the limits are not well defined. The Amharic language, developed from the ancient Gheez, and written since the sixteenth century, has gradually gained ground in Southern and Central Abyssinia, and has also become the Court language.

**AMHERST** (am'ĕrst). A seaport of Canada, in Nova Scotia, on an arm of Chignecto Bay, with flourishing industries, and trade by railway and sea. Pop. 8973.

Also a port of Burmah, 31 miles south of Moulmein, a health resort of Europeans. Pop. 3750.

**AMHERST, Jeffrey, Lord.** Born 1717, died 1797; distinguished British general, who fought at Dettingen and Fontenoy, and commanded in America, where he took Louisburg, Ticonderoga, and Quebec, and restored the British prestige in Canada. He was raised to the peerage, became commander-in-chief, and ultimately field-marshal.

**AMHERST, William Pitt.** First earl, nephew of the above; Governor-General of India, 1823; prosecuted the first Burmese war, and suppressed the Barrackpore mutiny. Born 1773, died 1857.

**AMIAN'THUS.** A kind of flexible asbestos. *See* ASBESTOS.

**AMICE** (am'is). An oblong piece of linen with an embroidered apparel sewed upon it, worn under the alb by priests of the Roman Catholic Church when engaged in the sacrifice of the mass.

**AMIDES** (am'id). Name used in chemistry. The amides are formed by replacing one of the hydrogen atoms of ammonia by an acid radicle, e.g. $C_2H_3ONH_2$, which is called acetamide. They are not strongly basic, and are usually crystalline, and have high boiling-points.

**AMIEL', Henri Frédéric.** French-Swiss philosophical writer and poet, born at Geneva, 1821, died there 1881. Educated at Geneva, he resided a considerable time abroad, especially in Germany, and was much influenced by German thought and science. On his return he first held the chair of æsthetics, and then that of philosophy. He published several volumes of poetry as well as other works, but he is best known by his *Journal Intime*, published after his death, and translated into English (1885), with a critical study by Mrs. Humphry Ward. It shows great critical and philosophical power, but is pessimistic.

**AMIENS** (à-mĕ-aŋ). A town of France, capital of the department of Somme, on the railway from Boulogne to Paris. It has a citadel, wide and and regular streets, and several large open areas; a cathedral, one of the largest and finest Gothic buildings in Europe, founded in 1220 by Bishop Evrard, after designs made by the architect Robert de Luzarches. Having water communication with the sea by the Somme, which is navigable for small vessels, it has a large trade and numerous important manufactures, especially cotton and woollen goods. It was taken by the Germans in 1870, and again in 1914, by General von Kluck. Pop. (1931), 90,211.—The **Peace of Amiens**, concluded between Great Britain, France, Spain, and the Batavian Republic, 27th March, 1802, put an end for a time to the great war which had lasted since 1793.

**AMINES.** A group of substances formed by replacing one or more of the hydrogen atoms of ammonia by alcohol or other radicles, e.g. $C_2H_5NH_2$, which is known as ethylamine. They resemble ammonia in having a strong smell, basic and other properties. Some amines are gases, others liquids or solids.

**AMIR.** *See* EMIR.

**AMIRANTE ISLANDS** (à-mĕ-ràn'tā). A group of eleven small islands in the Indian Ocean, lying south-west of the Seychelles, and forming a dependency of the Seychelles.

**AMLWCH** (am'lŏh). A seaport in North Wales, Island of Anglesey. Pop. (1921), 2694 (urb. dist.).

**AMMAN.** Capital of Transjordania and 30 miles from Jericho on the Hejaz Rly. It occupies the site of Rabbath-Amon mentioned in the Bible. In 1918 it was captured by the British and was made capital when the new State of Transjordania was created.

**AMMANA'TI, Bartolomeo.** A sculptor and architect, born at Florence in 1511, died 1592; executed the *Leda* at Florence, a gigantic *Neptune* for St. Mark's Place at Venice, a colossal *Hercules* at Padua, and after the inundation in 1557,

which destroyed all the bridges of the Arno, built the celebrated Trinity Bridge at Florence, finished in 1570. He was an imitator of Michelangelo without his inspiration and genius.

**AMMANFORD.** Market town and urban district of Carmarthenshire, 12 miles from Swansea and 210 from London, on the G.W. Rly. The chief industries are tinplate works and coal mines. Pop. (1931), 7160.

**AMMERGAU** (ăm'er-gou). A district in Upper Bavaria, having its centre in the villages of Ober and Unter Ammergau. The former village is famous on account of the Passion Play which is performed there, at intervals usually of ten years.

**AM'METER** (short for ampere-meter). An instrument used for the measurement of electric currents. For commercial use the scale is marked so as to read amperes directly, but for experimental purposes it is usual to have a scale with divisions numbered in tens, in which case the reading multiplied by a suitable constant gives the value of the current in amperes. By employing suitable shunts this admits of the one instrument being used for a number of ranges.

The types of ammeter and the principles upon which they work are as follows: (*a*) *Soft-iron type*, the action of a magnetic field on a piece of soft iron; (*b*) *moving-coil type* and *dynamometer type*, the action of a magnetic field on a current-carrying coil; (*c*) *hot-wire type*, the expansion of a conductor due to the heating produced by the current; (*d*) *induction type*, the action of a magnetic field on the eddy currents produced in a metal disc.

The "soft-iron" ammeter can be used for both direct and alternating currents, is inexpensive, and is sufficiently accurate for commercial use.

For direct-current measurements where a high degree of accuracy is of first importance, a "moving-coil" ammeter is invariably used.

In alternating-current circuits its place is taken by the dynamometer type, which reads both direct and alternating currents.

In cases where absence of inductance in the instrument is important, e.g. in the measurements in wireless-telegraph and telephone circuits, the "hot-wire" ammeter is used. It measures both direct and alternating currents, and, when properly used, has a high degree of accuracy.

The "induction" type cannot be used for direct currents, and has the limitation that with alternating currents it will read correctly only at the frequency for which it is calibrated.

Almost invariably an ammeter gives its full-scale reading when a small current, say of the order of one-tenth of an ampere, is passing through the instrument itself. In order to read larger currents a device is employed whereby a definite fraction of the current to be measured passes through the instrument.—BIBLIOGRAPHY: J. A. Fleming, *A Handbook for the Electrical Laboratory and Testing Room* (2 vols.); G. D. Aspinall Parr, *Electrical Measuring Instruments*.

**AMMIA'NUS MARCELLI'NUS.** A Roman historian, born at Antioch in Syria about 320, died about 390. He wrote in 31 books (of which the first 13 are lost) a history of the Cæsars, from Nerva to Valens, which was highly thought of by Gibbon for its fidelity. His MS. was printed for the first time at Rome in 1474.

**AM'MON** (often called **AMMON-RA**, i.e. Ammon-Sun). An ancient Egyptian deity, one of the chief gods of the country, identified by the Greeks with their supreme god Zeus, while the Romans regarded him as

Ammon—an Egyptian Deity

the representative of Jupiter; represented as a ram, as a human being with a ram's head, ornamented with the solar disc, or simply with the horns of a ram. There was a celebrated temple of Ammon in the Oasis of Siwah in the Libyan desert.

**AMMON, Oasis of.** *See* SIWAH.

**AMMO'NIA.** An alkaline substance, which differs from the other alkalies by being gaseous, and is hence sometimes called the *volatile alkali*. It is a colourless pungent gas, composed of nitrogen and hydrogen;

formula, $NH_3$. It was first prepared by Priestley, who termed it *alkaline air*. He obtained it from sal-ammoniac by the action of lime, by which method it is yet generally prepared. It is used for many purposes, both in medicine and scientific chemistry; not, however, in the gaseous state, but frequently in solution in water, under the names of *liquid ammonia, aqueous ammonia,* or *spirits of hartshorn*. It is generally prepared from the ammoniacal liquor obtained as a by-product on distilling coal. Combined with acids, ammonia forms salts which are of immense value to agriculture. The well-known odour of farmyard manure is very largely due to the formation of ammonia during the rotting of the dung. Many animal substances, such as bones, clippings and shavings of horn, hoof, etc., and certain vegetable matters yield ammonia when heated. Sal-ammoniac is ammonium chloride.

**AMMONI'ACUM.** A gum-resinous exudation from an umbelliferous plant, the *Dorĕma ammoniăcum*. It has a fetid smell, is inflammable, soluble in water and spirit of wine; used as an antispasmodic, stimulant, and expectorant in chronic catarrh, bronchitic affections, and asthma; also used for plasters.

**AMMO'NIAPHONE.** An instrument, consisting of a metallic tube containing some substance saturated with ammonia, peroxide of hydrogen, and a few flavouring compounds, fitted with a mouthpiece to breathe through, which is said to render the voice strong, clear, rich, and ringing by the inhalation of the ammoniacal vapour. It was invented by Dr. Carter Moffat, and was suggested by the presence of ammonia in some quantity in the atmosphere of Italy —the country of fine singers.

**AMMONITE.** A compound of nitrogen used as a safety explosive for blasting in coal mines.

Another ammonite is a fertiliser made from the offal of rendering establishments and containing a high proportion of nitrogen.

**AM'MONITES.** A group of fossil cephalopods, now divided into a large number of genera, ranging from the Coal Measures (Texas) to the uppermost cretaceous strata. The ammonites differ from the nautili in having the tube connecting the chambers placed on the outer margin of the coiled shell, while the calcareous neck where it passes through the partitions is directed forwards. The partitions are much folded, producing markings like the fronds of ferns where they meet the inner wall of the shell. The name arises from confusion with a coiled gastropod, which was held to resemble the horns of the Egyptian deity Jupiter Ammon.

**AM'MONITES.** A Semitic race frequently mentioned in Scripture, descended from Ben-Ammi, the son of Lot (Gen. xix. 38), often spoken of in conjunction with the Moabites. A predatory and Bedouin race, they inhabited the desert country east of Gad, their chief city being Rabbath-Ammon (Philadelphia). Wars between the Israelites and the Ammonites were frequent; they were overcome by Jephthah, Saul, David, Uzziah, Jotham, etc. They appear to have existed as a distinct people in the time of Justin Martyr, but have subsequently become merged in the aggregate of nameless Arab tribes.

**AMMO'NIUM.** The name given to the hypothetical radicle (formula, $NH_4$) of ammonium salts. It functionates as a metal, has not been isolated, but is believed to exist in an amalgam with mercury.

**AMMO'NIUS SAC'CAS.** A Greek philosopher who lived about A.D. 175-240. Originally a porter in Alexandria, he derived his epithet from the carrying of *sacks* of corn. The son of Christian parents, he abandoned their faith for the polytheistic philosophy of Greece. His teaching was historically a transition stage between Platonism and Neo-Platonism. Among his disciples were Plotinus, Longinus, Origen, etc. The books often attributed to him are by a Christian philosopher of the same name.

**AMMUNI'TION.** Another form of the word munition, with a more restricted meaning. It is now taken to include cartridges of all sorts for guns, howitzers, rifles, and all fire-arms. Ammunition comprises both cartridges in which explosive and missiles are combined to form one compact article, and also other forms of projectiles of which the explosive agent forms one portion and the actual missile the other. Bombs, grenades, shells, powder, and bullets are all included in the generic term ammunition. As a qualifying word used adjectivally it is found in ammunition-wagon, ammunition-carrier, ammunition-mules, ammunition-column, etc. In the British service the Royal Army Ordnance Corps is entrusted with the provision of supplies of ammunition generally, while the actual distribution in the field is the duty of the ammunition-column, a Royal Artillery organisation.

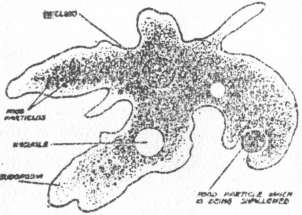
**AMNESIA.** Greek word meaning *forgetfulness*, used by doctors to describe loss of memory. It can be caused by shock or injury to or disease of the brain. An operation to the brain, or, in some cases, rest, sometimes effects a cure.

**AM'NESTY** (Gr. *amnestia*, forgetfulness). The releasing of a number of persons who have been guilty of political offences from the consequence of these offences. The earliest recorded amnesty in history is that of Thrasybulus at Athens, and the last act of amnesty passed in Britain was that of 1747, after the second Jacobite rebellion.

**AM'NION.** The innermost membrane surrounding the fetus of mammals, birds, and reptiles.—In botany, a gelatinous fluid in which the embryo of a seed is suspended, and by which it is supposed to be nourished.

**AMO'AFUL.** Village near Kumassi, West Africa, at which the Ashanti were defeated by British troops under Wolseley, 31st Jan., 1874.

**AMŒ'BA.** A microscopic genus of rhizopodous Protozoa, of which *A. diffluens*, common in fresh-water ponds and ditches, is the type. It exists as a mass of protoplasm, and pushes its body out into finger-like processes or pseudopodia, and by means of these moves about or




Nature's Simplest "Mind"

The single-celled amœba has the power of responding to stimuli and of accepting or rejecting food—the first signs of "feeling" and "knowing"

grasps particles of food. There is no distinct mouth, and food is engulfed within any portion of the soft sarcode body. Reproduction takes place by fission, or by a single pseudopodium detaching itself from the parent body and developing into a separate amœba.

**AMŒBE'AN POETRY.** Poetry in which persons are represented as speaking alternately, as in some of Virgil's *Eclogues*.

**AMOK.** Word used for an outbreak of madness. It consists of running wild and injuring any one who may be met. It originated among the Malays who sometimes act in this way, rushing about and using their knives indiscriminately. It may be due to a sudden fit of madness, or to the use of drugs.

**AMOL'.** A town of Northern Persia, 76 miles N.E. of Teheran. Extensive ruins tell of former greatness, the most prominent being the mausoleum of Seyed Quam-u-deen, who died in 1378. Pop. in winter estimated at about 40,000.

**AMO'MUM.** A genus of plants of the nat. ord. Zinziberaceæ (ginger, etc.), natives of warm climates, and remarkable for the pungency and aromatic properties of their seeds. Some of the species yield Cardamoms, others Grains of Paradise.

**AMONTILLA'DO.** A dry kind of sherry wine of a light colour, highly esteemed.

**AMOOR.** *See* AMUR.

**A'MOR.** The god of love among the Romans, equivalent to the Gr. *Erōs*.

**AMOR'GO** (ancient **AMORGOS**). An island in the Grecian Archipelago, one of the Eastern Cyclades, 22 miles long, 5 miles broad; area, 106 sq. miles; it has a town of the same name, with a castle and a large harbour. Pop. 3561.

**AM'ORITES.** A powerful Canaanitish tribe at the time of the occupation of the country by the Israelites; occupied the whole of Gilead and Bashan, and formed two powerful kingdoms—a northern, under Og, who is called King of Bashan; and a southern, under Sihon, called King of the Amorites; first attacked and overthrown by Joshua; subsequently subdued, and made tributary or driven to mingle with the Philistines and other remnants of the Canaanitish nations.

**AMORPHOUS ROCKS** or **MINERALS.** Those having no regular structure, or without crystallization, even in the minutest particles.

**AMORPHOZO'A.** A term applied to some of the lower groups of animals, as the sponges and their allies, which have no regular symmetrical structure.

**AMORTIZA'TION.** In law, the alienation of real property to corporations (that is, in *mortmain*), prohibited by several English statutes.

**A'MOS.** One of the minor prophets; flourished under the Kings Uzziah of Judah and Jeroboam II. of Israel (810 to 784 B.C. by the common chronology). Though en-

gaged in the occupations of a peasant he must have had a considerable amount of culture, and his book of prophecies has high literary merits. It contains denunciations of Israel and the surrounding nations, with promises of the Messiah.

**AMOY'.** An important Chinese trading port, on a small island off the south-east coast opposite Formosa; has a safe and commodious harbour, and its merchants are among the wealthiest and most enterprising in China; one of the five ports opened to foreign commerce by the treaty of Nanking in 1842. The privilege was confirmed and extended by the treaty of Tientsin in 1858, and the port is now open to all countries. Pop. 300,000.

**AMPEL'IDÆ.** *See* CHATTERERS.

**AMPÈRE** (ăn-pār), **André-Marie.** A celebrated French mathematician and philosopher, founder of the science of electro-dynamics, born at Lyons in 1775, died at Marseilles in 1836; professor of mathematical analysis at the Polytechnic School, Paris, and of physics at the College of France. What is known as *Ampère's Theory* is that magnetism consists in the existence of electric currents circulating round the particles of magnetic bodies, being in different directions round different particles when the bodies are unmagnetized, but all in the same direction when they are magnetized.

**AMPÈRE, Jean-Jacques-Joseph-Antoine.** Historian and professor of French literature in the College of France; the only son of André-Marie Ampère; born at Lyons 1800, died 1864; chief works: *Histoire Littéraire de la France avant le 12e siècle* (1839); *Introduction à l'Histoire de la Littérature française au moyen âge* (1841); *Littérature, Voyages et Poésies* (1833); *La Grèce, Rome et Dante, Études Littéraires d'après Nature*; *l'Histoire romaine à Rome* (4 vols. 8vo, 1856-64); *Promenades en Amérique* (1855); *César, Scènes historiques* (1859), full of hostile allusions to the French Empire.

**AMPERE** (am'pār). In electricity, the unit employed in measuring the strength or intensity of an electric current, being equivalent to the current produced by the electromotive force of one volt in a wire having the resistance of one ohm. The name (cf. *Farad, Coulomb, Watt*, etc.) is derived from that of the well-known physicist, Ampère. An *ampere-meter* or *ammeter* is an instrument by which the strength of an electric current is given in amperes.

**AMPHIB'IA.** A class of vertebrate animals, which in their early life breathe by gills or branchiæ, and afterwards partly or entirely by lungs. The Frog, breathing in its tadpole state by gills and afterwards throwing off these organs and breathing entirely by lungs in its adult state, is an example of the latter phase of amphibian existence. The Proteus of the underground caves of Central Europe exemplifies forms in which the gills of early life are retained throughout life, and in which lungs are developed in addition to the gills. A second character of this group consists in the presence of two occipital "condyles," or processes by means of which the skull articulates with the spine or vertebral column; Reptiles possessing one condyle only.

The class is divided into four orders: the Ophiomorpha (or serpentiform), represented by the Blindworms, in which limbs are wanting and the body is snake-like; the Urodela or "Tailed" Amphibians, including the Newts, Proteus, Sirens, etc.; the Anoura, or Tailless Amphibia, represented by the Frogs and Toads; and the Labyrinthodontia, which includes the extinct forms known as Labyrinthodons. The term Amphibia was originally employed by Linnæus in his *Systema Naturæ*, and adopted by Cuvier in his *Tableau Élémentaire*. *See* BATRACHIA.

**AMPHIBOL'OGY.** In logic, an equivocal phrase or sentence, not from the double sense of any of the words, but from its admitting a double construction, as "The duke yet lives that Henry shall depose."

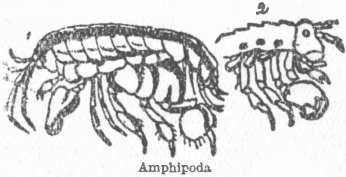
**AMPHIC'TYONIC LEAGUE** (or **COUNCIL**). In ancient Greece, a confederation of tribes for the protection of religious worship, but which also discussed questions of international law, and matters affecting their political union. The most important was that of the twelve northern tribes which met alternately at Delphi and Thermopylæ. The tribes sent two deputies each, who assembled with great solemnity; composed the public dissensions, and the quarrels of individual cities, by force or persuasion; punished civil and criminal offences, and particularly transgressions of the law of nations, and violations of the temple of Delphi. Its calling on the States to punish the Phocians for plundering Delphi caused the Sacred Wars, 595-586, 448-447, 357-346 B.C.

**AMPHI'ON.** In Greek mythology, son of Zeus and Antiŏpē, and husband of Niŏbē. He had miraculous skill in music, being taught by

Mercury, or, according to others, by Apollo. In poetic legend he is said to have availed himself of his skill when building the walls of Thebes—the stones moving and arranging themselves in proper position at the sound of his lyre. He was assisted by his brother Zethus.

**AMPHIOXUS.** *See* LANCELET.

**AMPHIP'ODA.** An order of sessile-eyed malacostracan crustaceans, with feet directed partly forward and



Amphipoda

1. Shore-jumper (*orchestia litoralis*). 2. Portion showing the respiratory organs

partly backward. Many species are found in springs and rivulets, others in salt water. The sand-hopper and shore-jumper are examples.

**AMPHIP'ROSTYLE.** In architecture, said of a structure having the form of an ancient Greek or Roman oblong rectangular temple, with a prostyle or portico on each of its ends or fronts, but with no columns on its sides or flanks.

**AMPHISBÆ'NA** (Gr., from *amphis*, both ways, and *bainein*, to go). A genus of serpentiform, limbless, lacertilian reptiles; body cylindrical, destitute of scales, and divided into numerous annular segments; the tail obtuse, and scarcely to be distinguished from the head, whence the belief that it moved equally well with either end foremost. There are several species, found in tropical America. They feed on ants and earthworms, and were formerly, but erroneously, deemed poisonous. In Greek mythology the amphisbæna was a serpent believed to possess two heads.

**AMPHIS'CII** (Gr. *amphi*, on both sides, and *skia*, shadow). A term sometimes applied to the inhabitants of the intertropical regions, whose shadows at noon in one part of the year are cast to the north and in the other to the south, according as the sun is in the southern or northern signs.

**AMPHITHE'ATRE.** An ancient Roman building of an oval form without a roof, having a central area (the *arena*) encompassed with rows of seats, rising higher as they receded from the centre, on which people used to sit to view the combats of gladiators and of wild beasts and other sports. The first amphitheatre at Rome was that constructed by C. Scribonius Curio, 59 B.C. The Colosseum at Rome is the largest of all the ancient amphitheatres, being capable of containing 100,000 persons, 87,000 of whom occupied numbered and reserved seats. That at Verona is one of the best examples remaining. Its dimensions are 502 feet by 401, and it is 98 feet high. The name means "both-ways theatre," or "theatre all round," the theatre forming only a semi-circular building.

Amphitheatre at Pompeii

**AMPHITRI'TÊ.** In Greek mythology, daughter of Océanus and Tethys, or of Nereus and Doris, and wife of Poseidon (or Neptune), represented as drawn in a chariot of shells by Tritons, with a trident in her hand. In the Homeric poems she is the personification of the Sea, and her marriage to Poseidon is alluded to in a number of scenes depicted on ancient monuments. Such are a bas-relief in the glyptothek at Munich and a mosaic in the museum at Naples.

**AMPHIT'RYON.** In Greek legend, King of Thebes, son of Alcæus, and

husband of Alcmena. Plautus, and after him Molière, have made an amour of Jupiter with Alcmena the subject of amusing comedies.

**AMPHIU'MA.** A genus of amphibians which frequent the lakes and stagnant waters of North America. The adults retain the clefts at which the gills of the tadpole projected.

**AM'PHORA.** A vessel used by the Greeks and Romans for holding liquids; commonly tall and narrow,

Amphora
From a Roman specimen in the British Museum

with two handles and a pointed end which fitted into a stand or was stuck in the ground to enable it to stand upright; used also as a cinerary urn, and as a liquid measure—Greek=9 gallons; Roman=6 gallons.

**AMPLEX'ICAUL.** In botany, said of a leaf that embraces and nearly surrounds the stem.

**AMPLIFIER.** An apparatus used in wireless installation to increase the strength of electric oscillations so that the sounds can be heard more clearly on the telephone or the loud speaker. They are of two main kinds. If amplification takes place before the high frequency oscillations are rectified by the detector, the amplifier is a high, or radio, frequency one. If it takes place after the oscillations are rectified it is a low, or audio, frequency amplifier. The degree of amplification depends upon the magnifying power of the thermionic valve used, or the ratio of its grid voltage change to its plate voltage change. This may be from 2 to 20. Several valves may be connected together so that the incoming impulses are increased in strength step by step.

**AM'PLITUDE.** In astronomy, the distance of any celestial body (when referred by a secondary circle to the horizon) from the east or west points.

**AMPTHILL.** A market-town of England, Bedfordshire, about 7 miles south-west of Bedford. Pop. (1931), 2167.

The title of **Baron Ampthill** was taken in 1881 by Odo William Leopold Russell, a son of Lord George Russell and a grandson of the Duke of Bedford. Born Feb. 20, 1829, he entered the diplomatic service and from 1871 to his death, April 25, 1884, he was ambassador in Berlin, his term of office covering the important years 1878-79. His son, the second baron, was Governor of Madras, 1899-1906, and a prominent oarsman.

**AMPUL'LA.** The Latin name for a vessel bellying out like a jug, which contained unguents for the bath; also a vessel for drinking at table. The ampulla has also been employed for ceremonial purposes, such as holding the oil or chrism used in various Church rites and for anointing monarchs at their coronation. The ampulla of the English sovereigns now in use is an eagle, weighing about 10 oz., of the purest chased gold, which passed through various hands to the Black Prince. The ampulla of the French kings, kept at Rheims in the tomb of St. Remy, was destroyed in 1793.

**AMPUTA'TION.** In surgery, that operation by which a member is separated from the body.

**AMRA'OTI.** A town of British India in Berár; it is celebrated for its cotton, and is a place of good trade. Pop. 35,000. The district has an area of 4733 sq. miles. Pop. 876,000.

**AM'RITSIR,** or **AMRITSAR** ("the pool of immortality"). A flourishing commercial town of India, capital of a district of the same name, in the Punjab, the centre of the Sikh religion since the end of the sixteenth century. It has considerable manufactures of shawls and silks; and receives its name from the sacred pond constructed by Ram Das, the apostle of the Sikhs, in which the Sikhs and other Hindus immerse themselves that they may be purified from all sin. Pop. 160,218.—The **district of Amritsir** has an area of 1601 sq. miles. Pop. 900,000.

**AM'RU.** Originally an opponent, and subsequently a zealous supporter

of Mahomet, and one of the ablest of the Mahommedan warriors. He brought Egypt under the power of the Caliph Omar in 638, and governed it wisely till his death in 663. The burning of the famous Alexandrian Library has been generally attributed to him, though only on the authority of a writer who lived six centuries later.

**AM'STERDAM** (that is, "the dam of the Amstel"). One of the chief commercial cities of Europe, capital of Holland (but not the residence of the sovereign), situated at the confluence of the Amstel with the Y or Ij, an arm of the Zuider Zee. On account of the lowness of the site of the city the greater part of it is built

Map showing position of Amsterdam

on piles. It is divided by numerous canals into about 90 islands, which are connected by nearly 300 bridges. Many of the streets have a canal in the middle with broad brick-paved quays on either side, planted with rows of trees; the houses are generally of brick, many of them six or seven stories high, with pointed gables turned to the streets.

**Buildings.** Among the public buildings are the old stadthouse, the work of Jacob van Kempen, commenced in 1648 and finished in 1655, which is now a royal palace, the interior being decorated by the Dutch painters and sculptors of the seventeenth century with their masterpieces; the justiciary hall, an imitation of a Greek temple; the town hall (fourteenth century); the exchange, a handsome building, constructed in 1836 on the site of the old bourse built in 1608; the Palace of National Industry; the national museum; and the central railway station. The old church is a structure of the fourteenth century with stained glass windows painted by Digman in the fifteenth century. The chief educational institutions of the kingdom are here, including the city university, a free university, gymnasiums and other secondary schools, the national picture gallery or museum, containing many masterpieces of Dutch artists, etc.

**Industries.** Among its numerous industries may be mentioned as a speciality the cutting and polishing of diamonds. It has also factories and workshops dealing with wool, cotton, silk, tobacco, leather, machinery, and metal goods, glass, liqueurs, cocoa, etc. The harbour, formed by the Y, lies along the whole of the north side of the city, and is surrounded by various docks and basins.

**Canals.** The trade is very great, being much facilitated by the great ship-canal (15 miles long, opened 1876, admitting the largest vessels) connecting the Y directly with the North Sea at Y-Muiden, where the entrance is between two long piers projecting into the sea. Another canal of much less importance, the North Holland Canal (46 miles long, 20 feet deep), connects Amsterdam with the Helder. Between the harbour and the Zuider Zee the Y is now crossed by a great dam in which are locks to admit vessels and regulate the amount of water in the North Sea Canal. The oversea trade of Amsterdam has immensely increased since the opening of the great canal, and the foreign trade of the kingdom practically centres in Amsterdam and Rotterdam. There is also a large trade with the interior by railway, river, and canal.

**History.** In the beginning of the thirteenth century Amsterdam was but a fishing village. In the fourteenth and fifteenth centuries it had attained some importance, especially through the Baltic trade. The ruin of Antwerp through the trouble with Spain was greatly to its advantage, and during the seventeenth and eighteenth centuries Amsterdam was one of the wealthiest and most flourishing cities in the world. The forced alliance with France ruined its trade, but since 1813 its commerce has revived. Amsterdam is the birthplace of Spinoza and of the painters van de Velde and van der Neer. Pop. 752,000.

**AMSTERDAM.** A town of New York State, United States, on the Mohawk River and the Erie Canal

33 miles N.W. of Albany; a busy manufacturing town. Pop. (1920), 33,524.

**AMSTERDAM, New.** A town in British Guiana, on the east side of the River Berbice, near the sea, with some trade as a seaport. Pop. 8903.

**AMSTERDAM ISLAND.** A small and almost inaccessible island in the Indian Ocean, about half-way in a direct line between the Cape of Good Hope and Tasmania. It is sparsely provided with vegetation, and inhabited only by sea-birds, but it was taken possession of by France in 1893, along with the neighbouring St. Paul. It was discovered by the Dutch in 1633.

**AMSTETTEN.** A town in Lower Austria, on the Ybbs, and on the railway from Vienna to Linz. In 1805 a victory was gained here by the French under Murat over the Russians under Bagration. Pop. 3760.

**AMUCK', or AMUK,** to run. A phrase applied to natives of the Eastern Archipelago, who are occasionally seen to rush out in a frantic state of temporary mental derangement, making indiscriminate and murderous assaults on all that come in their way.

**AMU-DARYA.** *See* OXUS.

**AMU-DARYA, district.** *See* TURKISTAN.

**AM'ULET.** A piece of stone, metal, etc., marked with certain figures or characters, which people in some countries wear about them, superstitiously deeming them a protection against diseases, enchantments, witchcraft, etc. According to Pliny the elder, the *bulla*, or amulet, was first hung by Tarquinius Priscus on the neck of his son. Articles that archæologists have decided to be amulets have been found dating from prehistoric times, and they were commonly worn in ancient times by the Jews, Greeks, and Romans, as they still are by Persians, Arabs, and many other peoples. *See* CHARMS.

**AMUNDSEN, Captain Roald.** Norwegian polar explorer, born at Borge, Norway, 16th July, 1872. He was first-lieutenant on the *Belgica* during the Belgian south polar expedition, 1897-9. On 17th June, 1903, he embarked from Christiania on the small sailing vessel the *Gjöa*, with a company of six men, and reached King William Land, where the vessel remained for two years. Here he made his headquarters, and by numerous excursions was able to prove that the north magnetic pole has no stationary position, but is in continual movement.

On 9th Aug., 1910, he sailed from Norway on Nansen's ship, the *Fram*, and reached the South Pole on 7th March, 1912. Amundsen started on a North Polar Expedition in 1918, but was delayed at Nome, Alaska.

In 1922 he made an unsuccessful attempt to fly to the Pole, and his ship, the *Maud*, proceeded without him. Amundsen returned to Europe. A Polar flight by aeroplane in 1925 was unsuccessful, but in 1926 he crossed the Pole by air-ship. In 1928 he set out in an aeroplane to search for Nobile and failed to return. Persistent search was made, but no trace of him was found. *See* POLAR EXPLORATION.—Cf. R. Amundsen, *The South Pole*.

**AMUR', or AMOOR'.** One of the largest rivers of Eastern Asia, formed by the junction of the Rivers Shilka and Argun; flows first in a south-eastern and then in a north-eastern direction till it falls into an arm of the Sea of Okhotsk, opposite the Island of Sakhalin, after a course of 1500 miles. It forms, for a large portion of its course, part of the boundary-line between the Russian and the Chinese dominions, and is navigable throughout for four months in the year.

**Amur Territory.** In 1858 Russia acquired from China the territory on the left bank of the Upper and Middle Amur, together with that on both banks of the Lower Amur. The western portion of the territory was organized as a separate province, with the name of the Amur (area, 154,795 sq. miles; pop. 261,500). The eastern portion was joined to the Maritime Province of Eastern Siberia.

**AM'URATH, or MURAD.** The name of several Ottoman sultans. *See* OTTOMAN EMPIRE.

**AMYCLÆ** (a-mi'klē). A town of ancient Greece, the chief seat of the Achæans in Laconia, a short distance from Sparta, by which it was conquered about 800 B.C.

**AMYG'DALOID** (Gr. *amygdalē*, an almond). Meaning "almond-shaped"; a term used in anatomy and geology.

**AMYG'DALUS.** The genus to which the almond belongs.

**AM'YL.** In chemistry, a hypothetic radicle believed to exist in many compounds, especially the fusel-oil series, and having the formula $C_5H_{11}$.

**Amyl Nitrite, or Nitrite of Amyl.** An amber-coloured fluid, smelling and tasting like essence of pears, which has been employed as an anæsthetic

and also in relieving cardiac distress, as in angina pectoris.

**AM'YLENE** ($C_5H_{10}$). An ethereal liquid with an aromatic odour, prepared from fusel-oil. It possesses anæsthetic properties, and has been tried as a substitute for chloroform, but is very dangerous.

**AMYL'IC ALCOHOL.** One of the products of the fermentation of grain, etc., commonly known by the name of fusel-oil (q.v.).

**AMYOT** (ă-mi-ō), **Jacques.** French writer and scholar, whose translations from the Greek have themselves become classics, was born in 1513, and died Bishop of Auxerre in 1593, having been for twelve years a professor of classics at Bourges, and having enjoyed the patronage of Margaret of Navarre and Henry II. His chief translations are those of Plutarch's *Lives* and his *Morals*, the *Æthiopica* of Heliodorus, and the *Daphnis* and *Chloe* of Longus. Sir Thomas North's English translation of Plutarch (1575), of which Shakespeare made much use, was derived from that of Amyot.

**AMYRIDA'CEÆ.** A nat. ord. of plants, consisting of tropical trees or shrubs, the leaves, bark, and fruit of which abound in fragrant resinous and balsamic juices. Myrrh, frankincense, and the gum-elemi of commerce are among their products. Among the chief genera of the order are *Amyris*, *Balsamodendron*, *Boswellia*, and *Canarium*.

**A'NA.** The neuter plural termination of Latin adjectives in *-ānus*, often forming an affix with the names of eminent men to denote a collection of their memorable sayings—thus *Scaligeriana*, *Johnsoniana*, the sayings of Scaliger, of Johnson; or to denote a collection of anecdotes, or gossipy matter, as in *boxiana*. Hence, as an independent noun, books recording such sayings; the sayings themselves.

**ANABAP'TISTS** (from the Gr. *anabaptizein*, to rebaptize). A name given to a Christian sect by their adversaries, because, as they objected to infant baptism, they rebaptized those who joined their body. Their doctrine is based upon the words of Christ in St. Mark xvi. 16. The founder of the sect appears to have been Nicolas Storch, a disciple of Luther's, who seems to have aimed also at the reorganization of society based on civil and political equality. Gathering round him a number of fiery spirits, among whom was Thomas Münzer, he incited the peasantry of Suabia and Franconia to insurrection—the doctrine of a community of goods being now added to their creed. This insurrection was quelled in 1525, when Münzer was put to the torture and beheaded.

After the death of Münzer the sectaries dispersed in all directions, spreading their doctrines wherever they went. In 1534 the town of Münster in Westphalia became their centre of action. Under the leadership of Bockhold and Matthias their numbers increased daily, and being joined by the restless spirits of the adjoining towns, they soon made themselves masters of the town and expelled their adversaries. Matthias became their prophet, but he fell in a sally against the Bishop of Münster, Count Waldeck, who had laid siege to the city. Bockhold then became leader, assuming the name of John of Leyden, King of the New Jerusalem, and Münster became a theatre of all the excesses of fanaticism, lust, and cruelty. The town was eventually taken (June, 1535), and Bockhold and a great many of his partisans suffered death. This was the last time that the movement assumed anything like political importance.

In the meantime some of the apostles who were sent out by Bockhold to extend the limits of his kingdom, had been successful in various places, and many independent teachers, who preached the same doctrines, continued active in the work of founding a new empire of pure Christians. It is true that they rejected the practice of polygamy, community of goods, and intolerance towards those of different opinions which had prevailed in Münster; but they enjoined upon their adherents the other doctrines of the early Anabaptists, and certain heretical opinions in regard to the humanity of Christ, occasioned by the controversies of that day about the sacrament.

The most celebrated of those Anabaptist prophets were Melchior Hoffmann, the founder of the Hoffmannists or Millenarians; Galenus Abrahamssohn, from whom the sect of the Galenists were called; and Menno Simons, founder of various sects known as Mennonites. Menno's principles are contained in his *Principles of the True Christian Faith* (1556), a work which is held as authoritative on points of doctrine and worship among the Baptist communities at the present day.

The application of the term Anabaptist to the general body of Baptists throughout the world is unwarranted, because these sects have nothing in common with the bodies which sprung up in various countries of Europe during the Reformation, except the practice of adult baptism

The Baptists themselves repudiate the name Anabaptist, as they claim to baptize according to the original institution of the rite, and never repeat baptism in the case of those who in their opinion have been so baptized. It is under the designation of Mennonites that they exist to-day, principally in Holland, Germany, and the United States.

**AN'ABAS.** *See* CLIMBING-PERCH.

**ANAB'ASIS** (Gr. *anabasis*, a march up country). The title of Xenophon's celebrated account of the expediton of Cyrus the Younger against his brother Artaxerxes, King of Persia. The title is also given to Arrian's work which records the campaigns of Alexander the Great.

**AN'ABLEPS.** A genus of fishes of the perch family, found in the rivers of Guiana, consisting of but one species, remarkable for a peculiar structure of the eyes, in which there is a division of the iris and cornea, by transverse ligaments forming two pupils, and making the whole eye appear double. The young are brought forth alive.

**ANABOLISM** (Gr. *ana*, up, and *bolé*, a throw). A biological term suggested by Michael Foster, and used by Gaskell in 1886, and meaning the building-up of organic life, or the process by which a substance is transformed into another which is more complex. Anabolism is the constructive phase of metabolism (q.v.).

**ANACANTHI'NI** (Gr. neg. prefix *an*, and *akantha*, a spine). An order of osseous fishes, including the cod, plaice, etc., with spineless fins, cycloid or ctenoid scales, the ventral fins either absent or below the pectorals, and ductless swim-bladder.

**ANACARDIA'CEÆ.** A nat. ord. of plants, consisting of tropical trees and shrubs which secrete an acrid resinous juice, which is often used as a varnish. Mastic, Japan lacquer, and Martaban varnish are some of their products. The cashoo or cashew (genus Anacardium), the pistacia, sumach, mango, etc., are members of the order.

**ANACH'ARIS.** A genus of plants nat. ord. Hydrocharidaceæ, the species of which grow in ponds and streams of fresh water; water-thyme or water-weed. It appeared in Britain in the nineteenth century. *A. Alsinastrum* has been introduced from North America into European rivers, canals, and ponds, and by its rapid growth in dense tangled masses tends to choke them so as materially to impede navigation. The plants in our canals perfect no seed, their spread being due to vegetative vigour only.

**ANACH'RONISM.** An error of chronology by which things are represented as coexisting which did not coexist; applied also to anything foreign to or out of keeping with a specified time. Thus it is an anachronism when Shakespeare, in *Troilus and Cressida*, makes Hector quote Aristotle. There are anachronisms in the *Cid* and the *Nibelungenlied*, and also in Dante's *Inferno*, when the poet introduces pagan mythology into the Christian hell.

**ANACOLU'THON.** A want of grammatical and logical sequence in the structure of a sentence.

**ANACON'DA.** The popular name of two of the largest species of the serpent tribe, viz. a Ceylonese species

Anaconda (*Python tigris*)

of the genus Python (*P. tigris*), said to have been met with 33 feet long; and *Eunectes murinus*, a native of tropical America, allied to the boa-constrictor, and the largest of the

serpent tribe, attaining the length of 40 feet. They frequent swamps and rivers, are without poison fangs, and kill their victims by constriction.

**ANACONDA.** A town of the United States, Montana, with the largest copper-smelting works in the world. Pop. (1920), 11,668.

**ANAC'REON.** An amatory lyric Greek poet of the sixth century B.C.; native of Teos, in Ionia. Only a few fragments of his works have come down to us; the collection of odes that usually passes under the name of Anacreon is mostly the production of a later time, the poetry of the real Anacreon being much less frivolous.

**ANADYOM'ĔNĒ** (Gr., "she who comes forth"). A name given to Aphroditē (Venus) when she was represented as rising from the sea, as in the celebrated painting by Apelles, painted for the temple of Æsculapius at Cos, and afterwards in the temple of Julius Cæsar at Rome.

**ANADYR** (à-nà'dĕr). The most easterly of the larger rivers of Siberia and of all Asia; rises in the Stanovoi Mountains, and falls into the Gulf of Anadyr; length, 600 miles.

**ANÆMIA** (Gr., "want of blood"). A medical term applied to an unhealthy condition of the body, in which there is a diminution of the red corpuscles which the blood should contain. The principal symptoms are paleness and general want of colour in the skin, languor, emaciation, want of appetite, fainting, palpitation, etc.

**ANÆSTHE'SIA,** or **ANÆSTHE'SIS.** A state of insensibility to pain, produced by inhaling chloroform, or by the application of other anæsthetic agents.

**ANÆSTHET'ICS.** Are medical agents chiefly used in surgical operations for the abolition of pain. They are divided into (1) **general anæsthetics,** those in which consciousness is produced; (2) **local anæsthetics,** those which act upon the nerves of a limited area alone.

The earliest record of attempts to produce anæsthesia is to be found in the thirteenth century. Since then many agents have been tried. The first scientific effort was in 1800, when Sir Humphry Davy experimented with nitrous oxide, but without practical result. In 1844 Wells, an American dentist, used nitrous oxide, also without result. In 1846 Morton, another American dentist, used ether, and from that time it was increasingly used in America. In the same year the first operation under ether was performed in University College Hospital, London.

In 1847 Sir James Simpson (Edinburgh) introduced chloroform. Through his influence it was soon largely used throughout England and Scotland, and continued to be the chief anæsthetic till about the end of the nineteenth century, when ether again became popular in England.

To-day, in England, as always in the United States, ether is the most widely-used anæsthetic. Much controversy exists regarding the respective merits of ether and chloroform. The general opinion is, that ether is on the whole safer, but more liable, in the British climate, to be followed by bronchitis; while there are various conditions when chloroform is still preferable. They are frequently combined in use.

**Nitrous oxide gas** (laughing gas) is much used in dentistry. Lately, nitrous oxide has been used with ether; while ether and oxygen together were much used with the British Expeditionary Force in France during the European War (1914-8). The administration of all anæsthetics is helped when the patient is given a hypodermic injection of morphia shortly before.

**Twilight Sleep,** increasingly used in childbirth, is the production of a partial anæsthesia by the administration of scopolamin morphine.

**Local anæsthetics** are much used in minor surgery, and with proper technique act effectively. Cocaine was the first of these, and is still widely used. Of later developments, eucaine and novocaine are best known. Spinal anæsthesia is the injection of stovaine or similar substance into the spinal cord, producing anæsthesia of a large part of the body, varying according to the site of the injection.

**ANAGAL'LIS.** A genus of the nat. ord. Primulaceæ, to which belongs the Pimpernel, the "poor man's weather-glass." *See* PIMPERNEL.

**ANAGNI** (à-nän'yē). A town of Italy, province of Rome; the seat of a bishopric erected in 487. Pop. 10,400.

**AN'AGRAM.** The transposition of the letters of a word or words so as to form a new word or phrase, a connection in meaning being frequently preserved; thus, *evil, vile*; *Horatio Nelson, Honor est a Nilo* (honour is from the Nile). The seventeeth century was the golden age of the anagram, but it was employed by the Hebrews and the Greeks.

**ANAHUAC** (à-nà-wàk'; Mex., "near the water"). An old Mexican

name applied to the plateau of the city of Mexico, from the lakes situated there, generally elevated from 6000 to 9000 feet above the sea.

**AN'AKIM.** The posterity of Anak, the son of Arba, noted in sacred history for their fierceness and loftiness of stature. Their stronghold was Kirjath-arba or Hebron, which was taken and destroyed by Caleb and the tribe of Judah.

**ANAKOLU'THON.** *See* ANACOLUTHON.

**ANALEP'TIC.** A restorative or invigorating medicine or diet.

**AN'ALOGUE.** In comparative anatomy an organ in one species or group having the same function as an organ of different structure in another species or group, as the wing of a bird and that of an insect, both serving for flight. Organs in different animals having a similar anatomical structure, development, and relative position, independent of function or form, such as the arm of a man and the wing of a bird, are termed *homologues*.

**ANAL'OGY.** Is the mode of reasoning from resemblance to resemblance. When we find on attentive examination resemblances in objects apparently diverse, and in which at first no such resemblances were discovered, a presumption arises that other resemblances may be found by further examination in these or other objects likewise apparently diverse. It is on the belief in a unity in nature that all inferences from analogy rest. The general inference from analogy is always perfectly valid. Wherever there is resemblance, similarity or identity of cause somewhere may be justly inferred; but to infer the particular cause without particular proof is always to reason falsely. Analogy is of great use and constant application in science, in philosophy, and in the common business of life.

**ANAL'YSIS.** The resolution of an object, whether of the senses or the intellect, into its component elements. The word was introduced by Boyle in the seventeenth century. In philosophy it is the mode of resolving a compound idea into its simple parts, in order to consider them more distinctly, and arrive at a more precise knowledge of the whole. It is opposed to *synthesis*, by which we combine and class our perceptions, and contrive expressions for our thoughts, so as to represent their several divisions, classes, and relations.

**Analysis, in mathematics,** is, in the widest sense, the expression and development of the functions of quantities by calculation; in a narrower sense the resolving of problems by algebraic equations. The analysis of the ancients was exhibited only in geometry, and made use only of geometrical assistance, whereby it is distinguished from the analysis of the moderns, which extends to all measurable objects, and expresses in equations the mutual dependence of magnitudes. Analysis is divided into lower and higher, the lower comprising, besides arithmetic and algebra, the doctrines of functions, of series, combinations, logarithms, and curves, the higher comprising the differential and integral calculus, and the calculus of variations.

**Analysis, in chemistry,** is the process of decomposing a compound substance with a view to determine either (*a*) what elements it contains (*qualitative analysis*), or (*b*) how much of each element is present (*quantitative analysis*). Thus by the first process we learn that water is a compound of hydrogen and oxygen, and by the second that it consists of one part of hydrogen by weight to eight parts of oxygen. As a means of testing soils and feeding-stuffs, analysis has given important results; it has enabled Liebig to solve the problem of plant-nutrition.

**ANALYST.** Name given to a chemist or other scientist whose business is to analyse food, drink and other substances. Public analysts are employed by town and county councils and other authorities to examine specimens of food and drink that may be adulterated. Most of them are trained chemists and belong to the Society of Public and Other Analysts, at 85 Eccleston Square, London, S.W.1.

**ANAM.** *See* ANNAM.

**ANAMOR'PHOSIS.** A term denoting a drawing executed in such a manner as to present a distorted image of the object represented, but which, when viewed from a certain point, or reflected by a curved mirror or through a polyhedron, shows the object in its true proportions.

**AN'ANAS.** *See* PINE-APPLE.

**ANAPA'.** A seaport of Russia in province Kuban, on the Black Sea, 50 miles south-east of Kertsh, constructed by the Turks in 1781, and formerly fortified. Pop. about 7000.

**AN'APÆST.** In prosody, a foot consisting of two short and one long syllable, or two unaccented and one accented syllable, e.g.

⏑ ⏑ — ⏑ ⏑ — ⏑ ⏑ —

The As-syr-ian came down like the wolf on the fold.
—(Byron's *The Destruction of Sennacherib*.)

**AN'APLASTY.** A surgical operation to repair superficial lesions, or make up for lost parts, by the employment of adjacent healthy structure or tissue. Artificial noses, etc., are thus made.

**ANARAJAPOO'RA,** or **ANURADHAPURA.** A ruined city, the ancient capital of Ceylon, built about 540 B.C. and said to have covered an area of 300 sq. miles, doubtless a great exaggeration. There are still several dagobas in tolerable preservation, but the great object of interest is the sacred Bo-tree planted over 2000 years, and probably the oldest historical tree in the world, but shattered by a storm in 1887.

**AN'ARCHISTS.** A revolutionary sect or body setting forth as the social ideal the extreme form of individual freedom, holding that all government is injurious and immoral, and that the destruction of every social form now existing must be the first step to the creation of a new social system.

According to Herbert Spencer, anarchism is the doctrine of *laisser faire*. Anarchists usually look upon Diderot as one of their pioneers, and quote his lines : "La nature n'a fait ni serviteurs ni maîtres. Je ne veux ni donner ni reçevoir de lois." Historically, however, it is Proudhon who may be considered as the father of anarchism. The recognition of the anarchists as an independent sect may be dated from the secession of Bakunin and his followers from the Social Democrats at the congress of the Hague in 1872, since which they have maintained an active propaganda.

Their principal journals have been *La Révolte* (Paris), the *Freiheit* (New York), *Liberty* (Boston), and the *Anarchist* (London). Among modern philosophers of anarchism are Elisée Reclus and Prince Kropotkin.

**ANARTHROP'ODA.** One of the two great divisions (the Arthropoda being the other) of the Annulosa, or ringed animals, in which there are no articulated appendages. It includes the leeches, earthworms, tube-worms, etc.

**A'NAS.** A genus of web-footed birds, containing the true ducks.

**ANASARCA.** *See* DROPSY.

**ANASTA'SIUS I.** Emperor of the East, succeeded Zeno, A.D. 491, at the age of sixty. He was a member of the imperial life-guard, and owed his elevation to Ariadne, widow of Zeno, whom he married forty years after the death of her husband. He distinguished himself by suppressing the combats between men and wild beasts in the arena, abolishing the sale of offices, building the fortifications of Constantinople, etc. His support of the heretical Eutychians led to a dangerous rebellion. He died A.D. 518.

**ANASTAT'ICA.** A genus of cruciferous plants, including the Rose of Jericho (*A. hierochuntica*). *See* ROSE OF JERICHO.

**ANASTATIC PRINTING.** A process by which the perfect facsimile of a page of type or an engraving, old or new, can be reproduced and printed in the manner of a lithograph. The print or page to be transferred is dipped in diluted nitric acid, and, while moist with dilute acid, it is laid face downwards on a polished zinc plate and passed through a roller-press. The zinc is immediately corroded by the acid contained in the paper, excepting on those parts occupied by the ink of the type or engraving. The ink, while rejecting the acid, is loosened by it, and deposits a thin film on the zinc, thus protecting it from the action of the acid. The result is that those parts are left slightly raised in relief and greasy. The pate is then treated as in ordinary lithographic printing (q.v.).—BIBLIOGRAPHY: F. H. Collins, *Authors' and Printers' Dictionary* : C. T. Jacobi, *Printing*; J. Southward, *Modern Printing*.

**ANASTOMO'SIS.** In animals and plants, the inosculation of vessels, or the opening of one vessel into another, as an artery into another artery, or a vein into a vein. By means of anastomosis, if the course of a fluid is arrested in one vessel it can proceed along others. It is by anastomosis that circulation is re-established in amputated limbs, and in aneurism when the vessel is tied.

**ANATH'EMA.** Originally a gift hung up in a temple (Gr., *anatithēmi*, to lay up), and dedicated to some god, a votive offering; but it gradually came to be used for *expulsion, curse*. The Roman Catholic Church pronounces the sentence of anathema against heretics, schismatics, and all who wilfully pursue a course of conduct condemned by the Church. The subject of the anathema is declared an outcast from the Church, all the faithful are forbidden to associate with him, and the utter destruction of his body and soul is foretold.

**ANAT'IDÆ.** A family of swimming birds, including the Ducks, Swans, Geese, etc.

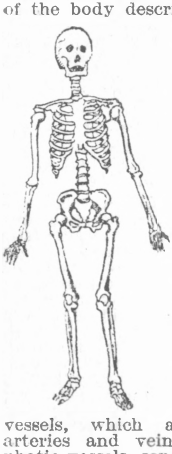
**ANATO'LIA** (from Gr. *anatolē*, the sunrise, the Orient). The modern name of Asia Minor (q.v.).

**ANATOLIAN RAILWAY.** *See* BAGDAD RAILWAY, TURKEY.

**ANAT'OMY.** In the literal sense means simply a cutting up, but is now generally applied both to the art of dissecting or artificially separating the different parts of an organized body (vegetable or animal) with a view to discover their situation, structure, and economy; and to the science which treats of the internal structure of organized bodies. By means of the dissection of the human body the surgeon and physician acquire the knowledge of the geography of the territory on which all their professional operations are carried on.

**Comparative Anatomy** is the science which compares the anatomy of different classes or species of animals, as that of man with quadrupeds, or that of quadrupeds with fishes. The anatomy of an animal may be studied from various standpoints: with relation to the succession of forms which it exhibits from its first stage to its adult form (*developmental* or *embryotical anatomy*); with reference to the general properties and structure of the tissues or textures (*general anatomy*, *histology*); with reference to the changes in structure of organs or parts produced by disease and congenital malformations (*morbid* or *pathological anatomy*); or with reference to the function, use, or purpose performed by the organs or parts (*teleological* or *physiological anatomy*).

**Divisions.** According to the parts of the body described, the different divisions of human anatomy receive different names; as, *osteology*, the description of the bones; *myology*, of the muscles; *arthrology*, of the ligaments and sinews; *splanchnology*, of the viscera or internal organs, in which are reckoned the lungs, stomach, and intestines, the liver, spleen, kidneys, bladder, pancreas, etc. *Angiology* describes the vessels through which the liquids in the body are conducted, including the blood-vessels, which are divided into arteries and veins, and the lymphatic vessels, some of which absorb



matters from the bowels, while others are distributed through the whole body, collecting juices from the tissues and carrying them back into the blood. *Neurology* describes the system of the nerves and of the brain; *dermatology* treats of the skin.

Among anatomical labours are particularly to be mentioned the making and preserving of anatomical preparations. Preparations of this sort can be preserved (1) by macerating the body so as to obtain the bones of the skeleton; or (2) by treating the body or some part of it with alcohol, formalin, or other preservative, which renders its tissues imperishable.

**Writers and Authorities.** Among the ancient writers or authorities on human anatomy may be mentioned Hippocrates the younger (460-377 B.C.), Aristotle (384-322 B.C.), Herophilus and Erasistratus of Alexandria (about 300 B.C.), Celsus (53 B.C.-A.D. 37), and Galen of Pergamus (A.D. 130-200), the most celebrated of all the ancient authorities on the science. From his time till the revival of learning in Europe in the fourteenth century anatomy was checked in its progress. In 1315 Mondino, professor at Bologna, first publicly performed dissection, and published a *System of Anatomy* which was a textbook in the schools of Italy for about 200 years.

In the sixteenth century Fallopio of Padua, Eustachi of Venice, Vesalius of Brussels, Varoli of Bologna, and many others, enriched anatomy with new discoveries. In the seventeenth century Harvey discovered the circulation of the blood, Asellius discovered the manner in which the nutritious part of the food is conveyed into the circulation, while the lymphatic system was detected and described by the Dane T. Bartoline. Among the renowned anatomists of later times we can only mention Malpighi, Boerhaave, William and John Hunter, the younger Meckel, Bichat, Rosenmüller, Quain, Sir A. Cooper, Sir C. Bell, Carus, Joh. Müller, Gegenbaur, Owen, and Huxley.

**History.** Until 1832 the law of Great Britain made very insufficient provision for enabling anatomists to obtain the necessary supply of subjects for dissection. An Act of some years previously had, it is true, empowered a criminal court, when it saw fit, to give up to properly-qualified persons the body of a murderer after execution for dissection. This, however, was far from supplying the deficiency, and many persons, tempted by the high prices offered for bodies by anatomists, resorted to the nefarious practice of

digging up newly-buried corpses, and frequently, as in the case of the notorious Burke and Hare of Edinburgh, to murder.

To remedy these evils a statute was passed in 1832, which was intended to make provision for the wants of surgeons, students, or other duly-qualified persons, by permitting, under certain regulations, the dissection of the bodies of persons who die friendless in alms-houses, hospitals, etc. The Act also appointed inspectors of anatomy, regulated the anatomical schools, and required persons practising the operations to obtain a licence. Relatives may effectually object to the anatomical examination of a body even though the deceased had expressed a desire for it.—BIBLIOGRAPHY: D. J. Cunningham, *Textbook of Anatomy*; J. Quain, *Elements of Anatomy*; A. M. Buchanan, *Manual of Anatomy*; A. Thomson, *Anatomy for Art Students*.

**ANAXAG'ORAS.** An ancient Greek philosopher of the Ionic school, born at Clazomenæ, in Ionia, probably about 500 B.C. When only about twenty years of age he settled at Athens, and soon gained a high reputation, and gathered round him a circle of renowned pupils, including Pericles, Euripides, Socrates, etc. At the age of fifty he was publicly charged with impiety and condemned to death, but the sentence was commuted to perpetual banishment. He thereupon went to Lampsacus, where he died about 428. Anaxagoras belonged to the atomic school of Ionic philosophers. He held that there was an infinite number of different kinds of elementary atoms, and that these, in themselves motionless and originally existing in a state of chaos, were put in motion by an eternal, immaterial, spiritual, elementary being, *Nous* (Intelligence), from which motion the world was produced. His conception of *Nous* as the first cause of movement marks a great advance in the history of philosophical thought, for he thus placed spirit above matter. The stars were, according to him, of earthy materials; the sun a glowing mass, about as large as the Peloponnesus; the earth was flat; the moon a dark, inhabitable body, receiving its light from the sun; the comets wandering stars.

**ANAXIMAN'DER.** An ancient Greek (Ionic) philosopher, was born at Miletus in 611 B.C., and died 547. The fundamental principle of his philosophy is that the source of all things is an undefined substance infinite in quantity. The firmament is composed of heat and cold, the stars of air and fire. The sun occupies the highest place in the heavens, has a circumference twenty-eight times larger than the earth, and resembles a cylinder, from which streams of fire issue. The moon is likewise a cylinder, nineteen times larger than the earth. The earth has the shape of a cylinder, and is placed in the midst of the universe, where it remains suspended.

His philosophy is thus a step in advance of the theories of Thales, the conception of the Infinite, however vague, being superior to the idea of water constituting the first principle of all things. Anaximander occupied himself a great deal with mathematics and geography. To him is credited the invention of geographical maps and the first application of the *gnomon* or style fixed on a horizontal plane to determine the solstices and equinoxes.

**ANAXIMENES OF MILETUS.** (an-aks-im'e-nēz) An ancient Greek (Ionic) philosopher, according to whom air was the first principle of all things. Finite things were formed from the infinite air by compression and rarefaction produced by eternally existent motion; and heat and cold resulted from varying degrees of density of the primal element. He flourished about 550 B.C.

**ANBURY** (an'be-ri) (called also **CLUB-ROOT** and **FINGERS AND TOES**). A disease in turnips, in which knobs or excrescences are formed on the root, which is then useless for feeding purposes. Some authorities distinguish anbury proper from "fingers and toes" in turnips, setting it down as a distinct disease due to a fungus, while in the other case the roots simply assume a bad habit of growth through some unknown influence.

**ANCACHS** (an-kach'). A department of Peru, between the Andes and the Pacific; area, 16,562 sq. miles. Capital Hararaz. Pop. 500,000.

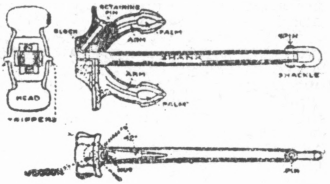
**ANCESTOR-WORSHIP.** An ancient and wide-spread practice, displayed in its most characteristic form in modern China and ancient Rome, which apparently was based upon the belief that dead parents or ancestors, represented by images or "ancestral tablets," could be revived by appropriate ceremonies, such as burning incense or offering libations, and give the benefit of their wisdom to their descendants who performed the vitalizing ritual and asked for their advice upon, or their sanction for, actions affecting the welfare of the family.

The earliest deity was a dead king

(Osiris), whose advice was sought by his son and successor. Hence in primitive religions, in which an endless variety of modifications of these more ancient beliefs has arisen, ancestor-worship may take the form of pious devotion to an actual ancestor or to a supernatural deity. As many of the most ancient gods were identified with animals, the dead ancestor, or his soul, is believed by many peoples to become incarnate in the appropriate animal, which is accorded the special veneration of a god or supernatural adviser, and set apart as sacred. Ancestor-worship still survives in a great variety of forms among various peoples.—BIBLIOGRAPHY: E. B. Tylor, *Primitive Culture*; F. B. Jevons, *Introduction to the History of Religion*; D. G. Brinton, *Religions of Primitive Peoples*.

**ANCHISES** (an-ki'sēz). The father of the Trojan hero Æneas, who carried him off on his shoulders at the burning of Troy and made him the companion of his voyage to Italy. This voyage, which is not mentioned in the Homeric legend, is described by Virgil in his *Æneid*. He died at Drepanum, in Sicily.

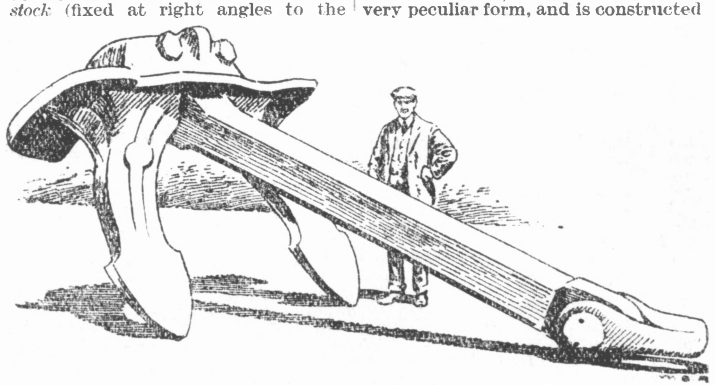
**AN'CHOR.** An implement for holding a ship or other vessel at rest in the water. In ancient times large stones or crooked pieces of wood heavily weighted with metal were used for this purpose. The anchor now used is of iron, formed with a strong *shank*, at one extremity of which is the *crown*, from which branch out two *arms*, terminating in broad *palms* or *flukes*, the sharp extremity of which is the *peak* or *bill*; at the other end of the shank is the *stock* (fixed at right angles to the plane of the arms), behind which is the *ring*, to which a cable can be




Modern Stockless Anchor (Hall's Patent)

attached. The principal use of the stock is to cause the arms to fall so as one of the flukes shall enter the ground. Many anchors are made nowadays without a stock. The anchors of the largest size carried by men-of-war are the *best* and *small bowers*, the *sheet*, and the *spare*, to which are added the *stream* and the *kedge*, which are used for anchoring in a stream or other sheltered place and for warping the vessel from one place to another.

Many improvements and novelties in the shape and construction of anchors have been introduced within recent times. The principal names connected with those alterations are those of Lieutenant Rodgers, who introduced the *hollow-shanked anchor* with the view of increasing the strength without adding to the weight; Porter, who made the arms and flukes movable by pivoting them to the stock instead of fixing them immovably, causing the anchor to take a readier and firmer hold, and avoiding the chance of the cable becoming foul; Trotman, who further improved on Porter's invention; and M. Martin, whose anchor is of very peculiar form, and is constructed



Type of Anchor used on such ships as Lusitania, Mauretania, etc.

so as to be self-canting, the arms revolving through an angle of 30° either way, and the sharp points of the flukes being always ready to enter the ground.

**AN'CHORITES,** or **AN'CHORETS** (Gr. *anachorētai,* persons who have withdrawn themselves from the world). In the early Church a class of religious persons who generally passed their lives in cells, from which they never removed. Their habitations were, in many instances, entirely separated from the abodes of other men, sometimes in the depth of wildernesses, in pits or caverns; at other times several of these individuals fixed their habitations in the vicinity of each other, but they always lived personally separate. The continual prevalence of fierce wars, civil commotions, and persecutions at the beginning of the Christian era must have made retirement and religious meditation agreeable to men of quiet and contemplative minds. This spirit, however, soon led to fanatical excesses; many anchorites went without proper clothing, wore heavy chains, and we find at the close of the fourth century Simeon Stylites passing thirty years on the top of a column without ever descending from it, and finally dying there.

In Egypt and Syria, where Christianity became blended with the Grecian philosophy and strongly tinged with the peculiar notions of the East, the anchorites were most numerous; in Europe there were comparatively few, and on the development and establishment of the monastic system they completely disappeared. *See* ASCETICISM.

**ANCHOVY** (an-chō'vi). A small fish of the herring family, all the species, with exception of the common anchovy (*Engraulis encrasichōlus*) and *E. meletta* (both Mediterranean species), inhabitants of the tropical seas of India and America. The common anchovy, so esteemed for its rich and peculiar flavour, is not much larger than the middle finger. It is caught in vast numbers in the Mediterranean, and frequently on the coasts of France, Holland, and the south of England, and pickled for exportation. A favourite sauce is made by pounding the pickled fish in water, simmering for a short time, adding a little cayenne pepper, and straining the whole through a hair-sieve.

**ANCHO'VY-PEAR** (*Grias cauliflōra*). A tree of the nat. ord. Myrtaceæ, a native of Jamaica, growing to the height of 50 feet, with large leaves and large white flowers, and bearing a fruit somewhat bigger than a hen's egg, which is pickled and eaten like the mango, and strongly resembles it in taste.

**ANCHU'SA.** *See* ALKANET.

**ANCHYLO'SIS.** *See* ANKYLOSIS.

**ANCIENT LIGHTS.** In English law, windows or other openings which have been in existence for at least twenty years, and during that time have enjoyed the access of light without interruption, so that a right is established against the obstruction of the light by a neighbouring proprietor.

**ANCILLON** (äṇ-sē-yōṇ), **Jean Pierre Frédéric.** An author and statesman of French extraction, born at Berlin in 1767 (where his father was pastor of the French reformed church); died there in 1837. He became professor of history in the military academy at Berlin, and in 1806 he was charged with the education of the crown-prince. He successively occupied several important offices of state, being at last appointed Minister of Foreign Affairs. He wrote on philosophy, history and politics, partly in French, partly in German.

**ANCKARSTRÖM.** *See* ANKARSTRÖM.

**ANCO'NA.** A seaport of Italy, capital of the province of the same name, on the Adriatic, 130 miles N.E. of Rome, with harbour works begun by Trajan, who built the ancient mole or quay. A triumphal arch of white marble, erected in honour of Trajan, stands on the mole. Ancona is a station of the Italian fleet, and the commerce is increasing. The town is indifferently built, but has some remarkable edifices, among others, the cathedral. There is a colossal statue of Count Cavour.

**History.** Ancona is said to have been founded about four centuries B.C., by Syracusan refugees. It fell into the hands of the Romans in the first half of the third century B.C., and became a Roman colony. Pop. 84,437. The province has an area of 748 sq. miles. Pop. 335,166.

**ANCONA FOWL.** *See* POULTRY.

**ANCRE** (äṇ-), **Concino Concini, Marshal and Marquis d'.** Was a native of Florence, and on the marriage of Marie de' Médici to Henri IV., in 1600, came in her suite to France, where he obtained rapid promotion, more especially after the assassination of the king (1610). He became successively Governor of Normandy, Marshal of France, and last of all, Prime Minister. Being thoroughly detested by all

classes, at last a conspiracy was formed against him, and he was shot dead on the bridge of the Louvre in 1617.

**ANCRE, Battle of.** This battle was the final one in the British offensive in France in 1916. It began on 13th Nov. after a two days' preliminary bombardment of the German salient, on both sides of the River Ancre, from Beaumont-Hamel to St. Pierre Divion. One area of extraordinary strength was the Y ravine which stretches from Beaumont-Hamel plateau towards the river. The assaults on both banks of the river were vigorous and determined. A fierce struggle was waged in the Y ravine, which Scottish troops ultimately cleared with the bayonet. Beaumont-Hamel having fallen, the British line was extended well beyond it. Further gains were made on the following day. The prisoners captured numbered 7200. This brilliant action paved the way for further successes in the spring.

**AN'CUS MAR'CIUS.** According to the traditionary history of Rome the fourth king of that city, who succeeded Tullus Hostilius, 638, and died 614 B.C. He was the son of Numa's daughter, and sought to imitate his grandfather by reviving the neglected observances of religion. He is said to have built the wooden bridge across the Tiber known as the Sublician, constructed the harbour of Ostia, and built the first Roman prison.

**ANCY'RA.** *See* ANGORA.

**ANDALU'SIA** (Sp. *Andalucia*). A large and fertile district in the south of Spain, bounded N. by Estremadura and New Castile, E. by Murcia, S. by the Mediterranean Sea, and W. by Portugal and the Atlantic; area, about 33,777 sq. miles, comprising the modern provinces of Seville, Huelva, Cadiz, Jaen, Cordova, Granada, Almeria, and Malaga. It is traversed throughout its whole extent by ranges of mountains, the loftiest being the Sierra Nevada, many summits of which are covered with perpetual snow (Mulahacen is 11,678 feet). Minerals abound, and several mines have been opened by English companies, especially in the province of Huelva, where the Tharsis and Rio Tinto copper-mines are situated. The principal river is the Guadalquivir. The vine, myrtle, olive, palm, banana, carob, etc., grow abundantly in the valley of the Guadalquivir.

Wheat, maize, barley, and many varieties of fruit grow almost spontaneously; besides which, honey, silk, and cochineal form important articles of culture. The horses and mules are the best in the Peninsula; the bulls are sought for bull-fighting over all Spain; sheep are reared in vast numbers. Agriculture is in a backward state, and the manufactures are by no means extensive. The Andulasians are descended in part from the Moors, of whom they still preserve decided characteristics. Andulasia is still famous for its bull-fighters. Pop. (1926), 4,416,047.

**ANDULASIAN FOWL.** *See* POULTRY.

**AN'DAMANS.** A chain of islands on the east side of the Bay of Bengal, the principal being the North, Middle, South, and Little Andamans. Middle Andaman is about 60 miles long and 15 or 16 miles broad. The total area of the group is 2508 sq. miles. The Andamanese, about 786 in number (1921), are mostly in a state of nature, living almost naked in the rudest habitations. They are small (generally much less than 5 feet), well-formed, and active, skilful archers and canoeists, and excellent swimmers and divers.

These islands have been used since 1858 as a penal settlement by the Indian Government, the settlement being at Port Blair, on South Andaman. Here rice, coffee, pineapples, nutmegs, etc., are grown, while the jungle has been cleared off the neighbouring hills. The natives in the vicinity of the settlement have become to some extent civilized. The climate is humid, but the settlement is healthy. Pop. (1921), 17,814.

**ANDANTE** (ân-dân'tā; It., "at a walking pace"). In music, denotes a movement somewhat slow, graceful, distinct, and soothing. The word is also applied substantively to that part of a sonata or symphony having a movement of this character. In Handel's music one often meets the expression *andante allegro*, which is equivalent to *andante con moto*.

**ANDELYS, Les** (lāz ănd-lēz). Two towns in France called respectively Grand and Petit Andely, distant half a mile from each other, in the department of Eure, on the right bank of the Seine, 19 miles S.E. of Rouen. Grand Andely dates from the sixth century, its church, built in the thirteenth century, is one of the finest in the department. Petit Andely owes its origin to Richard Cœur de Lion, who, in 1195, built here the Château Gaillard, in its time one of the strongest fortresses in France, but now wholly a ruin. Pop. 5530.

**ANDENNÉ'.** A town of Belgium, province of Namur, on the right bank

of the Meuse and 10 miles east of Namur; manufactures delftware, porcelain, tobacco-pipes, paper, etc. Pop. 7803.

**ANDERNACH** (ân'der-nâch). A town of Rhenish Prussia, on the left bank of the Rhine, 10 miles N.W. of Coblentz, partly surrounded with walls. Pop. 9800.

**AN'DERSEN, Hans Christian.** A Danish novelist, poet, and writer of fairy tales, was born of poor parents at Odense, 2nd April, 1805. He learned to read and write in a charity school, from which he was taken when only nine years old, and was put to work in a manufactory in order that his earnings might assist his widowed mother. In his leisure time he eagerly read national ballads, poetry, and plays, and wrote several tragedies full of sound and fury.

In 1819 he went to Copenhagen, but failed in getting any of his plays accepted, and in securing an appointment at the theatre, having to content himself for some time with unsteady employment as a joiner. His abilities at last brought him under the notice of Councillor Collin, a man of considerable influence, who procured for him free entrance into a Government school at Slagelse. From this school he was transferred to the university, and soon became favourably known by his poetic works.

Through the influence of Oehlenschläger and Ingermann he received a royal grant to enable him to travel, and in 1833 he visited Italy, his impressions of which he published in *The Improvvisatore* (1835)—a work which rendered his fame European. The scene of his following novel, *O. T.*, was laid in Denmark, and in *Only a Fiddler* he described his own early struggles. In 1835 appeared the first volume of his *Fairy Tales*, of which successive volumes continued to be published year by year at Christmas, and which have been the most popular and widespread of his works.

Among his other works are *Picture-books without Pictures*—conversations of the author with the moon, who came to visit the poet in his garret; *A Poet's Bazaar*—the result of a voyage in 1840 to the East; and a number of dramas. In 1845 he received an annuity from the Government. He visited England in 1848, and acquired such a command of the language that his next work, *The Two Baronesses*, was written in English. In 1855 he published an autobiography, under the title *My Life's Romance*, an English translation of which, published in 1871, contained additional chapters by the author, bringing the narrative to 1867. Among his later works we may mention, *To Be or Not to Be* (1857); *Tales from Jutland* (1859); *The Ice Maiden* (1863). He died 4th Aug., 1875, having had the pleasure of seeing many of his works translated into most of the European languages.

**ANDERSON.** A town of the United States, Indiana, on the west branch of White River, 32 miles north-east of Indianapolis, with various manufacturing works. Pop. 23,856.

**ANDERSON, Elizabeth Garrett, M.D.** Born in 1836, maiden name Garrett, married Mr. J. S. Anderson of the Orient Line of steamers. She studied medicine, but met with many obstacles, the study of medicine by women being then discouraged on all hands; at last she was licensed to practise by the Apothecaries' Society in 1865, and afterwards passed examinations at the University of Paris and obtained the degree of Doctor of Medicine. From 1866 to 1890 she was senior physician to the New Hospital for Women; from 1876 to 1898 lecturer on medicine in the London School of Medicine for Women. She did much to aid in opening the medical profession to women. In 1908 she was elected Mayor of Aldeburgh, being the first woman to hold the position of mayor in England. She died on 17th Dec., 1917.

Her daughter, Louisa Garrett Anderson, born in 1873, went to France in 1914 as Joint Organiser of and Chief Surgeon to the Women's Hospital Corps, Voluntary Unit.

**ANDERSON, James.** A Scottish writer on political and rural economy, born at Hermiston in 1739, died in 1808. In 1790 he started the *Bee*, which ran to eighteen volumes, and contains many useful papers on agricultural, economical, and other topics. Some of his other publications, *Recreations in Agriculture, Natural History*, etc., contain anticipations of theories afterwards propounded by Malthus and Ricardo.

**ANDERSON, John, F.R.S.** Professor of natural philosophy in the University of Glasgow, born 1726, died 1796. By his will he directed that the whole of his effects should be devoted to the establishment of an educational institution in Glasgow, to be denominated *Anderson's University*, for the use of the unacademical classes.

According to the design of the founder, there were to be four colleges—for arts, medicine, law, and theology—besides an initiatory school. As the funds, however, were totally

inadequate to the plan, it was at first commenced with only a single course of lectures on natural philosophy and chemistry. The institution gradually enlarged its sphere of instruction, coming nearer and nearer to the original design of its founder, the medical school in particular possessing a high reputation. In 1886 it was incorporated with other institutions to form the Glasgow and West of Scotland Technical College (now Glasgow Royal Technical College), Anderson's College medical school, however, retaining a distinct position.

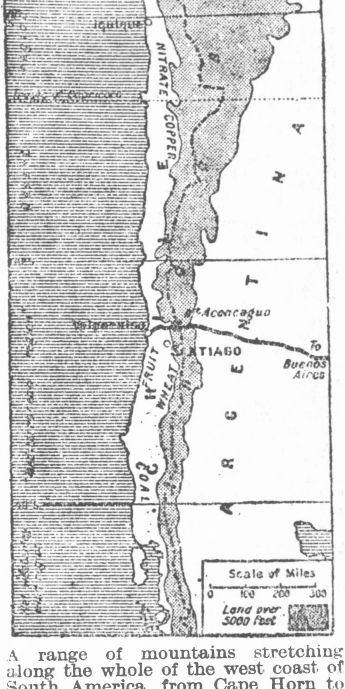
**ANDERSON, Joseph.** Scottish antiquary, born in 1832, became a school teacher, was for some years newspaper editor, and in 1870 was appointed keeper of the National Museum of Antiquities, Edinburgh. His chief works embody the lectures delivered by him as Rhind lecturer in archæology to the Society of Antiquaries of Scotland: *Scotland in Early Christian Times*, *Scotland in Pagan Times*, and the *Early Christian Monuments of Scotland*. He also edited *The Orkneyinga Saga*, *The Oliphants in Scotland*, and Drummond's *Ancient Scottish Weapons*. He died in 1916.

**ANDERSON, Mary Antoinette.** American actress. Born July 28, 1859, at Sacramento, California. In 1875 she made a first appearance on the stage, and soon became one of the leading actresses of the day. In 1883 she came to London where for some years she had an extraordinary popularity. She appeared in *A Winter's Tale*, *Romeo and Juliet*, and other Shakespearean plays as well as in *The Lady of Lyons*. In 1889 she retired and in 1890 married a Spanish gentleman, Antonio Navarro. In 1896 she published *A Few Memories*.

**ANDERSON, Robert, M.D.** Scottish biographical writer, born 1750, died 1830. He furnished biographical and critical notices for *A Complete Edition of the Poets of Great Britain* 1792-5), and was for a time editor of the *Edinburgh Magazine*.

**ANDERSSON, Carl Jan.** An African traveller, born in Sweden in 1827, died in the land of the Ovambos, in Western Africa, in July, 1867. He published *Lake Ngami, or Discoveries in South Africa* (London, 2 vols., 1856), and *The Okavango River* (London, 1861). The observations of his last voyage were published in 1875 in *Notes of Travel in South Africa*.

**ANDES** (an'dēz), or, as they are called in Spanish South America, **CORDILLERAS** (ridges) **DE LOS ANDES**, or simply **CORDILLERAS**.




A range of mountains stretching along the whole of the west coast of South America, from Cape Horn to the Isthmus of Panama and the Caribbean Sea. In absolute length (4500 miles) no single chain of mountains approaches the Andes, and only a certain number of the higher peaks of the Himalayan chain rise higher above the sea-level; which peak is the highest of all is not yet settled.

Several main sections of this huge chain are distinguishable. The Southern Andes present a lofty main chain, with a minor chain running parallel to it on the east, reaching from Tierra del Fuego and the Straits of Magellan, northward to about lat. 28° S., and rising in Aconcagua to a height of 23,080 feet. North of this is the double chain of the Central Andes, enclosing the wide and lofty plateaus of Bolivia and Peru, which lie at an elevation of more than 12,000 feet above the sea. The mountain system is here at its broadest, being about 500 miles

across. Here are also several very lofty peaks, as Illampu or Sorata (21,484 feet), Sahama (21,054 feet), Illimani (21,024 feet).

Farther north the outer and inner ranges draw closer together, and in Ecuador there is but a single system of elevated masses, generally described as forming two parallel chains. In this section are crowded together a number of lofty peaks, most of them volcanoes, either extinct or active. Of the latter class are Pichincha (15,918 feet), with a crater 2500 feet deep; Tunguragua (16,685 feet); Sangay (17,460 feet); and Cotopaxi (19,550 feet). The loftiest summit here appears to be Chimborazo (20,581 feet); others are Antisana (19,260 feet) and Cayambe (19,200 feet).

Northward of this section the Andes break into three distinct ranges, the eastmost running northeastward into Venezuela, the westmost running north-westward to the Isthmus of Panama. In the central range is the volcano of Tolima (17,660 feet). The western slope of the Andes is generally exceedingly steep, the eastern much less so, the mountains sinking gradually to the plains.

The whole range gives evidence of volcanic action, but it consists almost entirely of sedimentary rocks. Thus mountains may be found rising to the height of over 20,000 feet, and fossiliferous to their summits (as Illimani and Sorata or Illampu). There are about thirty volcanoes in a state of activity. The loftiest of these burning mountains seems to be Gualateĭri, in Peru (21,960 feet). The heights of the others vary from 13,000 to 20,000 feet.

All the districts of the Andes system have suffered severely from earthquakes, towns having been either destroyed or greatly injured by these visitations. Peaks crowned with perpetual snow are seen all along the range, and glaciers are also met with, more especially from Aconcagua southwards. The passes are generally at a great height, the most important being from 10,000 to 15,000 feet. Railways have been constructed to cross the chain at a similar elevation.

**Minerals and Animals.** The Andes are extremely rich in the precious metals, gold, silver, copper, platinum, mercury, and tin all being wrought; lead and iron are also found. The llama and kindred species—the guanaco, vicuña, and alpaca—are characteristic of the Andes. Among birds, the condor is the most remarkable.

**Vegetation and Lakes.** The vegetation necessarily varies much according to elevation, latitude, rainfall, etc., but generally is rich and varied. Except in the south and north little rain falls on the western side of the range, and in the centre there is a considerable desert area. On the east side the rainfall is heavy in the equatorial regions, but in the south is very scanty or altogether deficient. From the Andes rise two of the largest water systems of the world—the Amazon and its affluents, and the La Plata and its affluents. Besides which, in the north, from its slopes flow the Magdalena to the Caribbean Sea, and some tributaries to the Orinoco. The mountain chain pressing so close upon the Pacific Ocean, no streams of importance flow from its western slopes. The number of lakes is not great; the largest and most important is that of Titicaca on the Bolivian plateau.

**Towns.** In the Andes are towns at a greater elevation than anywhere else in the world, the highest being the silver-mining town of Cerro de Pasco (14,270 feet), the next being Potosi.

**AN'DESIN.** A kind of felspar containing both soda and lime, and named from being first obtained in the Andes.

**AN'DESITE.** A name given to a crystalline volcanic rock or group of rocks of very wide occurrence, consisting mostly of felspar mixed with other ingredients, especially hornblende and augite, often also hypersthene and mica, the four chief varieties being named accordingly. Andesite is often porphyritic in character, with large crystals of felspar scattered through it. These rocks are commonly eruptive products of volcanoes of the tertiary or more recent periods, and the name was given by C. L. von Buch on account of their prevalence in the lavas of volcanoes of the Andes. The Ochils and other hills of middle Scotland largely consist of andesite.

**ANDIJAN'.** A town of Russian Turkistan, Ferghana, south of the Sir Darya, a terminus of the Transcaspian Railway, 73 miles north-east of Khokand. Pop. 82,235.

**ANDI'RA.** A genus of leguminous American trees, with fleshy plum-like fruits. The wood is suitable for building purposes. The bark of *A. inermis*, or cabbage tree, is narcotic, and is used as an anthelminthic under the name of *wormbark* or *cabbage bark*. The powdered bark of *A. araröba* is used as a remedy in certain skin diseases, as herpes.

**ANDIRON** (and'ī-ėrn). A horizontal iron bar raised on short legs, with an upright standard at one end,

used to support pieces of wood when burning in an open hearth, one andiron being placed on either side of the hearth.

**ANDKHOO,** or **ANDKHOUI** (ând-hō′, ând-hō′i). A town of Afghanistan, about 200 miles south of Bukhara, on the commercial route to Herat. Pop. estimated at 15,000.

**ANDOCIDES** (an-dos′i-dēz). An Athenian orator, born about 440 B.C., died about 393 B.C. He took an active part in public affairs, and was four times exiled; the first time along with Alcibiades, for profaning the Eleusinian mysteries. Several of his orations are extant, one called *On the Mysteries* being the best.

**ANDOR′RA,** or **ANDORRE′.** A small nominally independent State in the Pyrenees, south of the French department of Ariége, with an area of about 191 sq. miles. It has been a separate State for six hundred years, is governed by its own civil and criminal codes, and has its own courts of justice, the laws being administered by two judges, one of whom is chosen by France, the other by the Bishop of Urgel, in Spain. The little State pays an annual due of 960 francs to France, and 460 pesetas to the Bishop of Urgel.

The chief industry is the rearing of sheep and cattle. The commerce is largely in importing contraband goods into Spain. The inhabitants, who speak the Catalan dialect of Spanish, are simple in their manners, their wealth consisting mainly of cattle and sheep. The village of Old Andorra is the capital. Pop. 5231.

**AN′DOVER.** A municipal borough in England, in Hants, 12 miles north by west of Winchester, with a fine church, and a trade in corn, malt, etc. Interesting Roman remains have been found in the vicinity. Pop. (1931), 9692.

**AN′DOVER.** A town in Massachusetts, 25 miles N.N.W. of Boston, chiefly remarkable for its literary institutions—Phillip's Academy, founded in 1778; The Andover Theological Seminary, founded in 1807; and Abbot Academy, a girls' school, founded in 1829. Pop. 7300.

**ANDRASSY** (ân-drä′shē), **Count Julius.** Hungarian statesman, born 1823, died in 1890. He took part in the revolution of 1848, was condemned to death, but escaped and went into exile. He was appointed Premier when self-government was restored to Hungary in 1867; became imperial Minister for Foreign Affairs in 1871, but retired from public life in 1879.

**ANDRASSY, Julius.** Hungarian statesman, son of the preceding. He was born in 1860, and entered the Reichstag in 1884. He became Minister of the Interior in 1906, and retained that office until 1909. In 1912 he represented Austria at the conference on the Balkan question. In 1918 he was appointed Minister for Foreign Affairs, but soon resigned. He died in 1929.

**ANDRÉ** (an′drā), **Major John.** Adjutant-general in the British army during the American revolutionary war. Employed to negotiate the defection of the American general Arnold, and the delivery of the works at West Point, he was apprehended in disguise, 23rd Sept., 1780, within the American lines; declared a spy from the enemy, and hanged 2nd Oct., 1780. His remains were brought to England in 1821 and interred in Westminster Abbey, where a monument has been erected to his memory.

**ANDREA DEL SARTO.** *See* SARTO.

**ANDREÆ** (ân′dre-ä), **Johann Valentin.** German author, born 1586, died 1654. He was the author of numerous tracts, several of them of an amusing and satirical character. He was long believed to be the founder of the celebrated Rosicrucian order, an opinion that received a certain support from some of his works, but in all probability the real intention of the writer was to ridicule the folly of contemporary alchemists.

**AN′DREASBERG, St.** A mining town of the Harz Mountains, in Prussia, 57 miles S.S.E. of Hanover. Pop. about 4000.

**ANDREEV, Leonid Nicolaievitsh.** Russian author, born in 1871, died in 1919. He studied law at the Universities of Moscow and Petrograd, but finding his practice unremunerative he became a police-court reporter for a daily paper. At the age of twenty-three he attempted suicide, driven to it by his miserable circumstances and struggle for existence. His first story, *About a Poor Student*, based upon his own experiences, attracted but little attention, and his literary career really began when Gorky discovered his talent. He was one of the most prolific Russian writers, the short story being his speciality. He was a mystic and a fatalist, like so many of his compatriots. His works include: *The Red Laugh* (1905); *The Seven who were Hanged* (1909); *Judas Iscariot and the Others* (1910); *A Dilemma* (1910); *Silence and Other Stories*, etc. His works have been translated into many European languages.

**ANDREW, St.** Brother of St. Peter, and the first disciple whom Christ chose. He is said to have preached in Scythia, in Thrace and Asia Minor, and in Achaia (Greece), and according to tradition he was crucified by order of the Roman governor Ægeas at Patræ, now Patras, in Achaia, on a cross of the form X (decussate cross), now known as a St. Andrew's cross. The Russians revere him as the apostle who brought the gospel to them; the Scots, as the patron saint of their country. The day dedicated to him is 30th Nov. The Russian order of St. Andrew was instituted by Peter the Great in 1698. For the Scottish Knights of St. Andrew or the Thistle, *see* THISTLE.

**AN'DREWES, Lancelot.** An eminent and learned bishop of the English Church, born in London in 1555, died at Winchester 1626; was high in favour both with Queen Elizabeth and James I. In 1605 he became Bishop of Chichester; in 1609 was translated to Ely, and appointed one of the king's privy-councillors; and in 1618 he was translated to Winchester. He was one of those engaged in preparing the authorized version of the Scriptures. He left sermons, lectures, and other writings.

**AN'DREWS, St.** An ancient city and parliamentary burgh in Fifeshire, Scotland, 31 miles north-east from Edinburgh; was erected into a royal burgh by David I. in 1140, and after having been an episcopal became an archi-episcopal see in 1472, and was for long the ecclesiastical capital of Scotland. The cathedral, now in ruins, was begun about 1160, and took 157 years to finish. The old castle, founded about 1200, and rebuilt in the fourteenth century, is also an almost shapeless ruin. In it James III. was born and Cardinal Beaton assassinated, and in front of it George Wishart was burned. There are several other interesting ruins. The trade and manufactures are of no importance, but the town is in favour as a watering place. Golf is much played. Pop. (1931), 8269.

The **University of St. Andrews**, the oldest of the Scottish universities, founded in 1411, consists of the united colleges of St. Salvator and St. Leonard and the college of St. Mary, both at St. Andrews, and embraces also University College, Dundee. In 1579 the colleges of St. Salvator and St. Leonard were restricted to the teaching of arts and medicine, and that of St. Mary to theology. In 1747 the two former colleges were united by Act of Parliament. University College, Dundee, was founded in 1880. The united college of St. Salvator and St. Leonard has a principal (who is also principal of the university) and twelve professors, and the college of St. Mary has a principal and four professors. Degrees, open to women as well as men, are conferred in arts, divinity, science, medicine, and law; and the university also confers the diploma and title of L.L.A. (Lady Literate in Arts). The number of students is 420.

In connection with the university is a library, founded in 1612 and containing about 150,000 printed volumes and 150 MSS. The university unites with the other three Scottish universities in returning three members to Parliament. Madras College or Academy, founded by Dr. Bell of Madras, the principal secondary school of the place, provides accommodation for upwards of 1500 scholars.

**AN'DREWS, Thomas.** Chemist, was born at Belfast in 1813; studied chemistry at Glasgow under Thomas Thomson, and for a short time in Paris; then medicine at Belfast, Dublin, and Edinburgh, taking the degree of M.D. at the last place. After practising and teaching chemistry for ten years in Belfast, he became vice-president of the Northern College there, which in 1849 was converted into Queen's College, and Andrews now became professor of chemistry in the college, a post which he held till 1879. He died in 1885, having received various academic distinctions in the course of his life.

His name is associated with valuable researches on the heat of chemical combustion, and on the nature of ozone, but especially with the discovery of the existence of a critical temperature for every gas, above which it cannot be liquefied by any pressure, however great. He wrote many scientific papers, which have been published in a collective form by P. G. Tait and A. Crum Brown.

**AN'DRIA.** A town of South Italy, province of Bari, with a fine cathedral, founded in 1046; the church of Sant' Agostino, with a beautiful Pointed Gothic portal; a college; manufactures of majolica, and a good trade. Pop. 53,274.

**ANDROCLUS, or ANDROCLES.** A Roman slave who once pulled a thorn out of a lion's paw and dressed the wound. Androclus was afterwards condemned to be thrown to the lions in the Circus Maximus, and

encountered the same lion that he had helped; the beast, instead of attacking him, fawned on him and caressed him. The story is told by Aulus Gellius, *Noctes Atticæ*, v. 14.

**ANDRŒ'CIUM.** In botany, the male system of a flower; the aggregate of the stamens.

**ANDROMACHE** (an-drom'a-kē). In Greek legend, wife of Hector, and one of the most attractive women of Homer's *Iliad*. The passage describing her parting with Hector, when he was setting out to battle, is well known and much admired (*Iliad*, vi. 369-502). Euripides and Racine have made her the chief character of tragedies.

**ANDROMĔDA.** In Greek mythology, daughter of the Ethiopian king Cepheus and of Cassiopeia. Cassiopeia having boasted that her daughter surpassed the Nereids, if not Hĕra (Juno) herself, in beauty, the offended goddesses prevailed on their father, Poseidŏn (Neptune), to afflict the country with a horrid seamonster, which threatened univeral destruction. To appease the offended god, Andromeda was chained to a rock, but was rescued by Perseus; and after death was changed into a constellation. The legend forms the subject of tragedies by Euripides and Sophocles, and Ovid introduced it into his *Metamorphosis*.

**ANDROMĔDA.** *See* ERICACEÆ.

**ANDRONI'CUS.** The name of four emperors of Constantinople.—**Andronicus I.,** Comnenus, born 1110, murdered 1185.—**Andronicus II.,** Palæologus, born 1258, died 1332. His reign is celebrated for the invasion of the Turks.—**Andronicus III.,** Palæologus the Younger, born 1296, died 1341.—**Andronicus IV.,** Palæologus, reigned in the absence of John IV. In 1373 he gave way to his brother Manuel, and died a monk.

**ANDRONI'CUS, Livius.** The most ancient of the Latin dramatic poets; flourished about 240 B.C.; by origin a Greek, and long a slave. A few fragments of his works have come down to us.

**ANDRONI'CUS OF RHODES.** A peripatetic philosopher who lived at Rome in the time of Cicero. He arranged Aristotle's works in much the same form as they retain in present editions.

**ANDRONI'CUS CYRRHESTES** (sir-es'tēz). A Greek architect about 100 B.C., who constructed at Athens the Tower of the Winds, an octagonal building, still standing. On the top was a Triton, which indicated the direction of the wind. Each of the sides had a sort of dial, and the building formerly contained a clepsydra or water-clock.

**ANDROPO'GON.** A large genus of grasses, mostly natives of warm countries. *A. Schœnanthus* is the sweet-scented lemon-grass of conservatories. Others also are fragrant.

**AN'DROS** (now **ANDRO**). One of the islands of the Grecian Archipelago, the most northerly of the Cyclades; about 25 miles long and 6 or 7 broad; area, 100 sq. miles. A considerable trade is done in silk, wine, olives, figs, oranges, and lemons. Andro or Castro, the capital, has a good port. Pop. 18,809.

**ANDROS ISLANDS.** A group of isles belonging to the Bahamas, lying south-west of New Providence, not far from the east entrance to the Gulf of Florida. The passages through them are dangerous. Pop. 7545.

**ANDRUSSOVO.** A Russian village in the government of Smolensk. A treaty was signed here between Poland and Russia (1667).

**ANDUJAR** (ăn-dō-hăr'). A town in Spain, in Andalusia, 50 miles E.N.E. of Cordova, on the Guadalquivir, which is here crossed by a fine bridge; manufactures a peculiar kind of porous earthen water-bottles and jugs (*alcarazas*). Pop. 16,500.

**AN'ECDOTE.** Originally some particular about a subject not noticed in previous works on that subject; now any particular or detached incident or fact of an interesting nature; a single passage of private life.

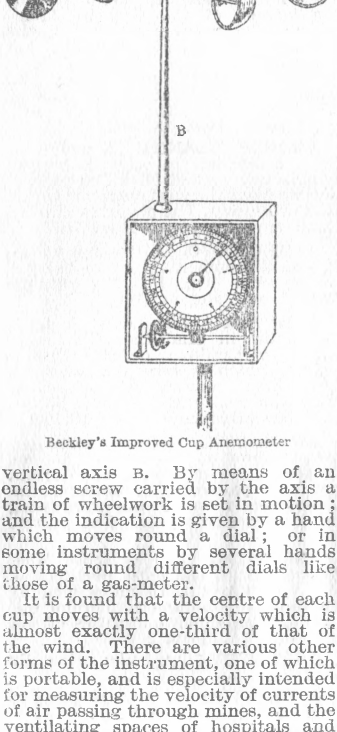
**ANEGA'DA.** A British West Indian island, the most northern of the Virgin group, 10 miles long by 4½ broad; contains numerous salt ponds, from which quantities of salt are obtained. Pop. 200.

**ANELECTRIC.** A body not easily electrified.

**ANELECTRODE.** The positive pole of a galvanic battery.

**ANEMOM'ETER** (Gr. *anēmos*, wind, *metron*, measure). An instrument for measuring the force and velocity of the wind. This force is usually measured by the pressure of the wind upon a square plate attached to one end of a spiral spring (with its axis horizontal), which yields more or less according to the force of the wind, and transmits its motion to a pencil which leaves a trace upon paper moved by clockwork. Various instruments have been devised for this purpose, but the one most commonly adopted by meteorological stations is after the type in-

vented by Dr. Robinson of Armagh. It consists of four hemispherical cups A attached to the ends of equal horizontal arms, forming a horizontal cross which turns freely about a




Beckley's Improved Cup Anemometer

vertical axis B. By means of an endless screw carried by the axis a train of wheelwork is set in motion; and the indication is given by a hand which moves round a dial; or in some instruments by several hands moving round different dials like those of a gas-meter.

It is found that the centre of each cup moves with a velocity which is almost exactly one-third of that of the wind. There are various other forms of the instrument, one of which is portable, and is especially intended for measuring the velocity of currents of air passing through mines, and the ventilating spaces of hospitals and other public buildings. The direction of the wind as indicated by a vane can also be made to leave a continuous record by various contrivances; one of the most common being a pinion carried by the shaft of a vane, and driving a rack which carries a pencil.

**ANEM'ŌNĒ** (Gr. *anĕmos*, wind), wind-flower. A genus of plants belonging to the Buttercup family (Ranunculaceæ), containing about ninety species, found in temperate regions, three of them occurring in Britain: the white-flowered (*A. nemorōsa*), the only one truly native; the blue-flowered (*A. apennina*); and the yellow-flowered (*A. ranunculoides*), a common European species naturalized in some parts of Britain. Several species are cultivated as florists' flowers.

**ANEMOPH'ILOUS.** Said of flowers that are fertilized by the wind conveying the pollen.

**ANEM'OSCOPE.** Any contrivance indicating the direction of the wind; generally applied to a vane which turns a spindle descending through the roof to a chamber where, by means of a compass-card and index, the direction of the wind is shown.

**ANEROID BAROMETER.** *See* BAROMETER.

**ANE'THUM.** A genus of plants; dill.

**ANEU'RIN.** A poet and prince of the Cambrian Britons who flourished in the seventh century, author of an epic poem, the *Gododin*, relating the defeat of the Britons of Strathclyde by the Saxons at the battle of Cattraeth. *See* CELTIC LITERATURE.

**AN'EURISM, or ANEURYSM** (Gr. *aneurysma*, a widening). The dilatation or expansion of some part of an artery. Aneurisms arise partly from the too violent motion of the blood, and partly from degenerative changes occurring in the coats of the artery, diminishing their elasticity. They are therefore more frequent in the great branches; in particular, in the vicinity of the heart, in the arch of the aorta, and in the extremities, where the arteries are exposed to frequent injuries by stretching, violent bodily exertions, thrusts, falls, and contusions. An internal aneurism may burst and cause death.

**ANGARA'.** A Siberian river which flows into Lake Baikal at its N. extremity, and leaves it near the S.W. end, joining the Yenisei as the Lower Angara or Upper Tunguska.

**ANGARY.** In International law, the seizure or destruction in time of war, of vessels belonging to a neutral, which are in the ports of the seizer. A country has the right to use the ships for its own purposes, but compensation must be paid. In early times angary meant the provision of horses and messengers for the public service.

**ANGEL** (Gr. *angelos*, a messenger). One of those spiritual intelligences who are regarded as dwelling in heaven and employed as the ministers or agents of God. To these the name of good angels is sometimes given, to distinguish them from bad angels, who were originally created

to occupy the same blissful abode, but lost it by rebellion.

The Old Testament represents them as messengers of the Divine will, and Christ spoke of them more than once (St. Matt. xviii. 10; St. Luke xv. 10). Generally, however, Scripture speaks of angels with great reserve, Michael and Gabriel alone being mentioned by name in the canonical books, while Raphael is mentioned in the Apocrypha. The angels are represented in Scripture as in the most elevated state of intelligence, purity, and bliss, ever doing the will of God so perfectly that we can seek for nothing higher or better than to aim at being like them. There are indications of a diversity of rank and power among them, and something like angelic orders—Michael, Gabriel, Raphael, Uriel, etc., seraphim and cherubim. They are represented as frequently taking part in communications made from heaven to earth, as directly and actively ministering to the good of believers, and shielding or delivering them from evils incident to their earthly lot.

That every person has a good and a bad angel attendant on him was an early belief, and is held to some extent yet. Roman Catholics, since St. Ambrosius, who died in 397, show a certain veneration or worship to angels, and beg their prayers and their kind offices. The New Testament, however, formally forbidding such veneration (Col. ii. 18, etc.), Protestants consider this unlawful.

**ANGEL.** A gold coin introduced into England in the reign of Edward

Angel of Queen Elizabeth

IV., and coined down to the Commonwealth, so named from having the representation of the archangel Michael piercing a dragon upon it. It had different values in different reigns, varying from 6*s.* 8*d.* to 10*s.*

**ANGEL-FISH.** A fish, *Squatina angĕlus*, nearly allied to the sharks, very ugly and voracious, preying on other fish. It is from 6 to 8 feet long, and takes its name from its pectoral fins, which are very large, extending horizontally like wings when spread. This fish connects the rays with the sharks, but it differs from both in having its mouth placed at the extremity of the head. It is common on the south coasts of Britain, and is also called *Monk-fish* and *Fiddle-fish*.

**ANGEL'ICA.** A genus of umbelliferous plants, one of which, *A. sylvestris*, a tall plant bearing large umbels of white flowers tinged with pink, is common in wet places in Britain, and was formerly believed to possess *angelic* properties as an antidote to poison, a specific against witchcraft, etc. The name is also given to an allied plant, the *Archangelica officinālis*, found on the banks of rivers and ditches in the north of Europe, once generally cultivated as an esculent, and still valued for its medicinal properties. It has a large fleshy aromatic root, and a strong-furrowed branched stem as high as a man. It is cultivated for its agreeable aromatic odour and carminative properties. Its blanched stems, candied with sugar, form a very agreeable sweetmeat, possessing tonic and stomachic qualities.

**ANGELICO** (ăn-jel'i-kō), **Fra.** The common appelation of **Fra Giovanni da Fiesole,** one of the most celebrated of the early Italian painters. Born 1387, he entered the Dominican order in 1407, and was employed by Cosmo de' Medici in painting the monastery of St. Mark and the church of St. Annunziata with frescoes. These pictures gained him so much celebrity that Pope Nicholas V. invited him to Rome to ornament his private chapel in the Vatican, and offered him the archbishopric of Florence, which Angelico declined. He died at Rome 1455.

He has been called the "painter of seraphic dreams." His works were considered unrivalled in finish and in sweetness and harmony of colour, and were made the models for religious painters of his own and succeeding generations.

**ANGELL, Sir Norman.** English author. Born Dec. 26, 1874, Ralph Norman Angell Lane was educated in France and passed some years in the United States, where he became a journalist. In 1899 he settled in Paris and in 1910 made a reputation with his book *The Great Illusion*, an analysis of the ruinous effects of war on all parties. His other books include *The Fruits of Victory*, 1921; *The Story of Money*, 1930; and *The Great Assassins*, 1932. From 1929 to 1931 he was Labour M.P. for Bradford North, and in 1931 he was knighted. He is editor of the periodical *Foreign Affairs*.

**ANGELN** (ăng'eln). A district in Schleswig of about 300 sq. miles,

bounded N. by the Bay of Flensburg, S. by the Schlei, E. by the Baltic, the only continental territory which has retained the name of the Angles.

**ANGELO** (ân'je-lō), **Michael.** *See* BUONAROTTI.

**AN'GELUS.** In the Roman Catholic Church, a short form of prayer in honour of the incarnation, consisting mainly of versicles and responses, the angelic salutation three times repeated, and a collect, so named from the word with which it commences, "*Angelus* Domini" (Angel of the Lord). Hence, also, the bell tolled in the morning, at noon, and in the evening to indicate the time when the angelus is to be recited. The prayer is attributed to St. Bonaventura, and in Germany and Italy it is called "Ave Maria."

**ANGERS** (âṅ-zhā). A town and river-port of France, capital of the department of Maine-et-Loire, and formerly of the province of Anjou, on the banks of the Maine, 5½ miles from the Loire, 150 miles south-west of Paris.

**Buildings.** It has an old castle, built by Louis IX., once a place of great strength, now used as a prison, barrack, and powder-magazine; a fine cathedral of the twelfth and thirteenth centuries, with very fine old painted windows; is the seat of a bishop, and has a school of arts and manufactures; a public library, an art-gallery, a large modern hospital, the remains of a hospital founded by Henry II. of England in 1155; courts of law, theatre, etc.

**Manufactures.** It manufactures sail-cloth, hosiery, leather, and chemicals; foundries, etc. In the neighbourhood are immense slate-quarries. Pop. (1926), 86,260.

**ANGEVINS** (an'je-vins). Natives of Anjou, often applied to the race of English sovereigns called Plantagenets (q.v.). Anjou became connected with England by the marriage of Matilda, daughter of Henry I. with Geoffrey V., Count of Anjou. The Angevin kings of England were Henry II., Richard I., John, Henry III., Edward I., Edward II., Edward III., and Richard II.

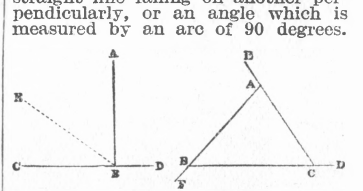
**ANGILBERT, St.** The most celebrated poet of his age, secretary and friend of Charlemagne, whose daughter, Bertha, he married. In the latter part of his life he retired to a monastery, of which he became abbot. Died 814.

**ANGINA PECTORIS** (an'ji-na pek'-to-ris), or **HEART-SPASM.** A disease characterized by an extremely acute constriction, felt generally in the lower part of the sternum, and extending along the whole side of the chest and into the corresponding arm, a sense of suffocation, faintness, and apprehension of approaching death; seldom experienced by any but those with organic heart-disease. The disease rarely occurs before middle-age, and is more frequent in men than in women. Those liable to attack must lead a quiet, temperate life, avoiding all scenes which would unduly rouse their emotions. The first attack is occasionally fatal, but usually death occurs as the result of repeated seizures. The paroxysm may be relieved by opiates, or the inhalation, under due precaution, of anæsthetic vapours.

**ANGIOSPERM** (an'ji-o-spèrm). A term for any plant which has its seeds enclosed in a seed-vessel. Exogens are divided into those whose seeds are enclosed in a seed-vessel, and those with seeds produced and ripened without the production of a seed-vessel. The former are *angiosperms*, and constitute the principal part of the species; the latter are *gymnosperms*, and chiefly consist of the Coniferæ and Cycadaceæ.

**ANGKOR.** The ruined temple of Angkor Vat, one of the architectural wonders of the world. It dates from the 12th century and was used for the worship of Brahma and then of Buddha. The word is a corruption of Nagara Thom.

**ANGLE.** The point where two lines meet, or the meeting of two lines in a point. A *plane rectilineal angle* is formed by two straight lines which meet one another, but are not in the same straight line; it may be considered the degree of opening or divergence of the two straight lines which thus meet one another. A *right angle* is an angle formed by a straight line falling on another perpendicularly, or an angle which is measured by an arc of 90 degrees.




When a straight line, as A B (fig. 1), standing on another straight line C D, makes two angles A B C and A B D equal to one another, each of these angles is called a *right angle*. An *acute angle* is that which is less than a right angle, as E B C. An *obtuse angle* is that which is greater than a right angle, as E B D. Acute

and obtuse angles are both called *oblique*, in opposition to right angles. *Exterior* or *external angles*, the angles of any rectilineal figure without it, made by producing the sides; thus, if the sides, A B, B C, C A of the triangle A B C (fig. 2) be produced to the points F D E, the angles C B F, A C D, B A E are called *exterior* or *external angles*. A *solid angle* is that which is made by more than two plane angles meeting in one point and not lying in the same plane, as the angle of a cube. A *spherical angle* is an angle on the surface of a sphere, contained between the arcs of two great circles which intersect each other.

**ANGLER** (*Lophius piscatorius*), also from its habits and appearance called **FISHING-FROG** and **SEA-DEVIL.** A remarkable fish often found on the British coasts. It is from 3 to 5 feet long; the head is very wide, depressed, with protuberances, and bearing long separate movable tendrils; the mouth is capacious, and armed with formidable teeth. Its voracity is extreme, and it is said to lie concealed in the mud, and attract the smaller fishes within its reach by gently waving the filamentous appendages on its head.

**ANGLES.** A Low German tribe who in the earliest historical period had their seats in the district about Angeln, in the duchy of Schleswig, and who in the fifth century and subsequently crossed over to Britain along with bands of Saxons and Jutes (and probably Frisians also), and colonized a great part of what from them has received the name of England, as well as a portion of the Lowlands of Scotland. The Angles formed the largest body among the Germanic settlers in Britain, and founded the three kingdoms of East Anglia, Mercia, and Northumbria.

**ANGLESEY** (ang'gl-sē), or **ANGLESEA** ("the Angles' Island"). An island and county of North Wales, in the Irish Sea, separated from the mainland by the Menai Strait; 20 miles long and 17 miles broad; area, 176,630 acres. The surface is comparatively flat, and the climate is milder than that of the adjoining coast. The chief agricultural products are oats and barley, wheat, rye, potatoes, and turnips. Numbers of cattle and sheep are raised. Anglesey yields a little copper, lead, silver, ochre, etc. The Menai Strait is crossed by a magnificent suspension bridge, 580 feet between the piers and 100 feet above high-water mark, and also by the great Britannia Tubular Railway Bridge. The chief market-towns are Beaumaris, Holyhead, Llangefni, and Amlwch. The county returns one member to Parliament. Pop. (1931), 49,025.

**ANGLESEY, Henry William Paget, Marquess of.** English soldier and statesman, was the eldest son of Henry, first Earl of Uxbridge, and was born in 1768. He was educated at Oxford, and in 1790 entered Parliament as member for the Carnarvon boroughs. In 1793 he entered the army, and in 1794 he took part in the campaign in Flanders under the Duke of York. In 1808 he was sent into Spain with two brigades of cavalry to join Sir John Moore, and in the retreat to Coruña commanded the rear-guard. In 1812 he became, by his father's death, Earl of Uxbridge. On Napoleon's escape from Elba he was appointed commander of the British cavalry, and at the battle of Waterloo, by the charge of the heavy brigade, overthrew the Imperial Guard. For his services he was created Marquess of Anglesey. In 1828 he became Lord-Lieutenant of Ireland and made himself extremely popular, but was recalled in consequence of favouring Catholic Emancipation. He was again Lord-Lieutenant in 1830, but lost his popularity by his opposition to O'Connell and his instrumentality in the passing of the Irish Coercion Acts; and he quitted office in 1833. From 1846-52 he was Master-General of the Ordnance. He died in 1854.

**ANGLICANISM.** The term is capable of a wider use, but is usually employed as descriptive of the type of doctrine formulated by the Church of England in the period of the Protestant Reformation. The two most notable formularies of that period are the Confession of Faith, known as the Thirty-nine Articles, which assumed its present shape in 1571, and the Liturgy, known as the Book of Common Prayer, issued in 1559 in what was substantially its present shape. By the Clerical Subscription Act of 1865 assent is required to both Prayer Book and Articles. The Articles are not and never were binding upon laymen.—BIBLIOGRAPHY: Mgr. Moyes, *Aspects of Anglicanism*; F. Y. Kinsman, *Principles of Anglicanism*.

**ANGLING.** The art of catching fish with a hook or *angle* (A. Sax. *angel*) baited with worms, small fish, flies, etc. We find occasional allusions to this pursuit among the Greek and Latin classical writers; it is mentioned several times in the Old Testament, and it was practised by the ancient Egyptians. The first reference to angling in England is a

passage in a tract, entitled *Piers Fulham*, supposed to have been written about the year 1420. The oldest work on the subject in English is the *Treatyse of Fysshinge with an Angle*, printed by Wynkyn de Worde in 1496, along with a treatise on hunting and hawking, the whole being ascribed to Dame Juliana Berners or Barnes, prioress of a nunnery near St. Albans. Walton's inimitable discourse on angling was first printed in 1653.

**Appliances.** The chief appliances required by an angler are a rod, line, hooks, and baits.

**Rods** are made of various materials, and of various sizes. The cane rods are lightest, and where fishing-tackle is sold they most commonly have the preference; but in country places the rod is often of the angler's own manufacture. Rods are commonly made in separate joints, so as to be easily taken to pieces and put up again. They are made to taper from the butt end to the top, and are usually possessed of a considerable amount of elasticity. In length they may vary from 10 feet to more than double that length, with a corresponding difference in strength—a rod for salmon being necessarily much stronger than one suited for ordinary burn trout.

The **reel**, an apparatus for winding up the line, is attached to the rod near the lower end, where the hand grasps it while fishing. The best are usually made of brass, are of simple construction, and so made as to wind or unwind freely and rapidly. That part of the line which passes along the rod and is wound on the reel is called the *reel line*, and may vary from 20 to 100 yards in length, according to the size of the water and the habits of the fish angled for; it is usually made of twisted horse-hair and silk, or of oiled silk alone.

The **casting line**, which is attached to this, is made of the same materials, but lighter and finer. To the end of this is tied a piece of fine gut, on which the hook, or hooks, are fixed. The casting or gut lines should decrease in thickness from the reel line to the hooks.

The **hook**, of finely-tempered steel, should readily bend without breaking, and yet retain a sharp point. It should be long in the shank and deep in the bend; the point straight and true to the level of the shank; and the barb long. Their sizes and sorts must of course entirely depend on the kind of fish that is angled for.

**Floats** formed of cork, goose and swan quills, etc., are often used to buoy up the hook so that it may float clear of the bottom. For heavy fish or strong streams a cork float is used; in slow water and for lighter fish quill floats.

**Baits** may consist of a great variety of materials, natural or artificial. The principal natural baits are worms: common garden worms, brandlings, and red worms, maggots, or gentles (the larvæ of blowflies such as are found on putrid meat), insects, small fish (as minnows), salmon roe, etc. The artificial flies so much used in angling for trout and salmon are composed of hairs, furs, and wools of every variety, mingled with pieces of feathers, and secured together by plaited wire, or gold and silver thread, marking-silk, wax, etc. The wings may be made of the feathers of domestic fowls, or any others of a showy colour. Some angling authorities recommend that the artificial flies should be made to resemble as closely as possible the insects on which the fish is wont to feed, but experience has shown that the most capricious and unnatural combinations of feather, fur, etc., have been often successful where the most realistic imitations have failed.

Artificial minnows, or other small fish, are also used by way of bait, and are so contrived as to spin rapidly when drawn through the water in order to attract the notice of the fish angled for. Angling, especially with the fly, demands a great deal of skill and practice, the casting of the line properly being the initial difficulty. Nowhere is the art pursued with greater success and enthusiasm than in Britain and the United States.—BIBLIOGRAPHY: *Fishing* (vol. i.), *Salmon and Trout* (vol. ii.), *Pike and Coarse Fish* (Badminton Library); H. G. Hutchinson, *Fishing* (2 vols., Country Life series); Viscount Grey, *Fly Fishing*; Gathorne-Hardy, *The Salmon*; Marquess of Granby, *The Trout*; H. T. Sheringham, *Elements of Angling*; W. M. Gallichan, *The Complete Fisherman*.

**ANGLO-CATHOLIC.** A term sometimes used to designate those churches which hold the principles of the English Reformation, the Anglican or Established Church of England and the allied churches. The term is also applied to that party in the English Church which favours doctrines and religious forms closely approaching those of the Roman Catholic Church, objects to be called Protestant, and corresponds closely with the *Ritualistic* section of the Church.

**ANGLO-EGYPTIAN SUDAN.** *See* SUDAN.

**ANGLO-SAXONS.** The name com-

nonly given to the nation or people ormed by the amalgamation of the Angles, Saxons, and Jutes, who ettled in Britain in the fifth and ixth centuries after Christ, the Anglo-Saxons being simply the English people of the earlier period of English history. The tribes who vere thus the ancestors of the bulk of the English-speaking nationalities ame from North Germany, where hey inhabited the parts about the nouths of the Elbe and Weser, and he first body of them who gained a ooting in Britain are said to have anded in 449, and to have been led by Hengist and Horsa. From the preponderance of the Angles the whole country came to be called *Engla-land*, that is, the land of the Angles or English.

xample of Saxon Architecture. Doorway, Earl's Barton, Northampton

Many scholars object to the term Anglo-Saxon" as being inaccurate nd open to misinterpretation. Correctly used, Anglo-Saxon means *English-Saxon*, as distinguished from he Old-Saxon of the Continent; ncorrectly used, as it has been too requently, it is taken as = Angle - Saxon, a union of Angle and axon. Camden (1551-1623) is responsible for the widespread use of he term; ignorance is responsible r the misuse. Many scholars prefer apply the term "O.d English" to e language and people of England efore A.D. 1100, partly because this rm is more accurate and partly because its use helps to emphasize the essential continuity of the language.

The whole Anglo-Saxon community was frequently spoken of as consisting of the *eorls* and the *ceorls*, or the nobles and common freemen. The former were the men of property and position, the latter were the small landholders, handicraftsmen, etc., who generally placed themselves under the protection of some noble man who was hence termed their *hláford* or lord. Besides these there was the class of the serfs or slaves (*theówas*), who might be either born slaves or freemen who had forfeited their liberty by their crimes, or whom poverty or the fortune of war had brought into this position. They served as agricultural labourers on their masters' estates, and were mere chattels, as absolutely the property of their master as his cattle.

The king (*cyning*, *cyng*) was at the head of the State; he was the highest of the nobles and the chief magistrate. He was not looked upon as ruling by any Divine Right, but by the will of the people, as represented by the *witan* (wise men) or great council of the nation. The new king was not always the direct and nearest heir of the late king, but one of the royal family whose abilities and character recommended him for the office. He had the right of maintaining a standing army of household troops, the duty of calling together the *witan*, and of laying before them public measures, with certain distinctions of dress, dwelling, etc., all his privileges being possessed and exercised by the advice and consent of the *witena-gemót* or parliament (literally, "meeting of the wise"). Next in rank and dignity to the king were the *ealdormen*, who were the chief witan or counsellors, and without whose assent laws could not be made, altered, or abrogated. They were at the head of the administration of justice in the shires, possessing both judicial and executive authority, and had as their officers the *scírgeréfan* or sheriffs. The ealdormen led the *fyrd* or armed force of the county, and the ealdorman, as such, held possession of certain lands attached to the office, and was entitled to a share of fines and other moneys levied for the king's use and passing through his hands.

The whole executive government may be considered as a great aristocratical association, of which the ealdormen were the members, and the king little more than the president. The ealdorman and the king were both surrounded by a number of followers called *thegnas* or thanes,

who were bound by close ties to their superior. The king's thanes were the higher in rank · they possessed a certain quantity of land, smaller in amount than that of an ealdorman, and they filled offices connected with the personal service of the king or with the administration of justice. The *scír-geréfa* (shire-reeve or sheriff) was also an important functionary. He presided at the county court along with the ealdorman and bishop, or alone in their absence; and he had to carry out the decisions of the court, levy fines, collect taxes, etc.

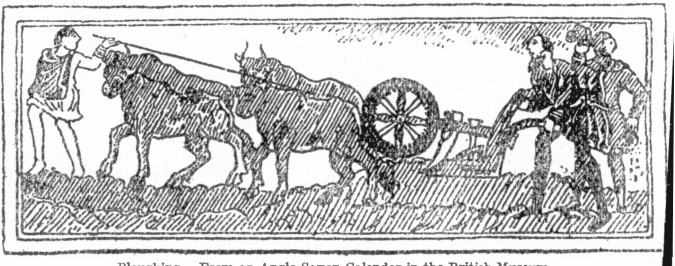
The shires were divided into hundreds and tithings, the latter consisting of ten heads of families who were jointly responsible to the State for the good conduct of any member of their body. For the trial and settlement of minor causes there was a hundred court held once a month. The place of the modern Parliament was held by the *witena-gemót*. Its members, who were not elected, comprised the æthelings or princes of the blood royal, the bishops and abbots, the ealdormen, the thanes, the sheriffs, etc.

**Wergyld.** One of the peculiar features of Anglo-Saxon society was the *wergyld*, which was established for the settling of feuds. A sum, paid either in kind or in money, was placed upon the life of every freeman, according to his rank in the State, his birth, or his office. A corresponding sum was settled for every wound that could be inflicted upon his person; for nearly every injury that could be done to his civil rights, his honour, or his domestic peace, etc. From the operation of this principle no one from king to peasant was exempt.

**Occupations.** Agriculture, including especially the raising of cattle, sheep, and swine, was the chief occupation of the Anglo-Saxons. Gardens and orchards are frequently mentioned, and vineyards were common in the southern counties. The forests were extensive, and valuable both from the mast they produced for the swine, and from the beasts of the chase which they harboured. Hunting was a favourite recreation among the higher ranks, both lay and clerical. Fishing was largely carried on, herrings and salmon being the principal fish caught; and the Anglo-Saxon whaling vessels used to go as far as Iceland. The manufactures were naturally of small moment. Iron was made to some extent, and some cloth, and saltworks were numerous. In embroidery and working of gold the English were famous over Europe. There was a considerable trade at London, which was frequented by Normans, French, Flemings, and the merchants of the Hanse towns.

**Mode of Living and Dress.** Our Anglo-Saxon forefathers were notorious for their excess in eating and drinking, and in this respect formed a strong contrast to their Norman conquerors. Ale, mead, and cider were the common beverages, wine being limited to the higher classes. Pork and eels were favourite articles of food. The houses were rude structures, but were often richly furnished and hung with fine tapestry. The dress of the people was loose and flowing, composed chiefly of linen, and often adorned with embroidery. The men wore their hair long and flowing over their shoulders.

**Religion.** Christianity was introduced among the Anglo-Saxons in the end of the sixth century by St. Augustine, who was sent by Pope Gregory the Great, and became the first Archbishop of Canterbury. Kent, then under King Ethelred, was the first place where it took root, and thence it soon spread over the rest of the country. The Anglo-Saxon Church long remained independent of Rome, notwithstanding the continual efforts of the Popes to bring it under their power. It was not till the tenth century that this result



Ploughing. From an Anglo-Saxon Calendar in the British Museum

was brought about by Dunstan. Many Anglo-Saxon ecclesiastics were distinguished for learning and ability, but the Venerable Bede holds the first place.

Anglo-Saxon Brooch
Ornament on front (left) is formed by means of plates of thin gold and wire, with bosses of ivory and red glass

**Anglo-Saxon Language.** The Anglo-Saxon language, which is simply the earliest form of English, claims kinship with Dutch, Icelandic, Danish, Swedish, and German, especially with the Low German dialects (spoken in North Germany). It was called by those who spoke it *Englisc* (English). The existing remains of Anglo-Saxon literature show different dialects, of which the northern and the southern were the principal. The former was the first to be cultivated as a literary language, but afterwards it was supplanted in this respect by the southern or that of Wessex. It is in the latter that the principal Anglo-Saxon works are written.

**Alphabet.** The Anglo-Saxon alphabet was substantially the same as that which we still use, except that some of the letters were different in form, while it had two characters either of which represented the sounds of *th* in *thy* and in *thing*. Nouns and adjectives are declined much as in German or in Latin. The pronouns of the first and second person had a dual number, "we two" or "us two" and "you two," besides the plural for more than two. The infinitive of the verb is in *-an*, the participle in *-ende*, and there is a gerund somewhat similar in its usage to the Latin gerund. The verb had four moods—indicative, subjunctive, imperative, and infinitive, but only two tenses, the present (often used as a future) and the past. Other tenses and the passive voice were formed by auxiliary verbs. Anglo-Saxon words terminated in a vowel much more frequently than the modern English, and altogether the language is so different that it has to be learned quite like a foreign tongue. Yet, notwithstanding the large number of words of Latin or French origin that our language now contains, and the changes it has undergone, its framework, so to speak, is still Anglo-Saxon. Many chapters of the New Testament do not contain more than 4 per cent of non-Teutonic words, and as a whole it averages perhaps 6 or 7.

**Literature.** The existing remains of Anglo-Saxon literature include compositions in prose and poetry, some of which must be referred to a very early period, one or two perhaps to a time before the Angles and Saxons emigrated to England.

The most important Anglo-Saxon poem is the ancient epic of *Beowulf*, extending to more than 6000 lines. Beowulf is a Scandinavian prince, who slays a monster named Grendel, after encountering supernatural perils, and is at last slain in a contest with a frightful dragon. Its scene appears to be laid entirely in Scandinavia. Its date is uncertain; parts of it may have been brought over at the emigration from Germany, though in its present form it is much later than this.

The poetical remains include a number of religious poems, or poems on sacred themes; ecclesiastical narratives, as lives of saints and versified chronicles; psalms and hymns; secular lyrics; allegories, gnomic poems, riddles, etc. The religious class of poems was the largest, and of these Cædmon's (flourished about 660) are the most remarkable. His poems consist of paraphrases of considerable portions of the Bible history, and treat of the creation, the temptation, the fall, the exodus of the Israelites, the story of Daniel, the incarnation, and the harrowing of hell, or release of the ransomed souls by Christ. Other most interesting poems are those ascribed to Cynewulf, the *Christ*, *Elene*, and *Juliana*, the subjects respectively being Christ, the finding of the cross by the Empress Helena, and the life of Juliana. Rhyme was not used in Anglo-Saxon poetry, alliteration being employed instead, as in older northern poetry generally. The style of the poetry is highly elliptical, and it is full of harsh inversions and obscure metaphors.

The Anglo-Saxon prose remains consist of translations of portions of the Bible, homilies, philosophical writings, history, biography, laws, leases, charters, popular treatises on science and medicine, grammars, etc. Many of these were translations from the Latin. The Anglo-Saxon versions of the Gospels, next to the Moeso-Gothic, are the earliest scriptural translations in any modern language. The Psalms are said to have been translated by Bishop Aldhelm (died 709), and also under Alfred's direc-

tion; and the *Gospel of St. John* by Bede; but it is not known who were the authors of the extant versions. A translation of the first seven books of the Bible is believed to have been the work of Ælfric, who was Abbot of Ensham and lived about the beginning of the eleventh century. We have also eighty homilies from his pen, several theological treatises, a Latin grammar, etc. King Alfred was a diligent author, besides being a translator of Latin works. We have under his name translations of Boethius' *De Consolatione Philosophice*, the *Universal History* of Orosius, Bede's *Ecclesiastical History*, the *Pastoral Care* of Gregory the Great, etc.

The most valuable to us of the Anglo-Saxon prose writings is the *Saxon Chronicle*, as it is called, a collection of annals recording important events in the history of the country, and compiled in different religious houses. Of this *Chronicle* there are seven MSS. in existence, and the latest text comes down to 1154. A considerable body of laws remains, as well as a large number of charters. The whole of the literature has never yet been printed. For Anglo-Saxon history, *see* ENGLAND. —BIBLIOGRAPHY: (History) H. M. Chadwick, *The Origin of the English Nation* (Cambridge); (Language) Sweet, *Anglo-Saxon Primer and Reader*; (Literature) B. ten Brink, *Geschichte der Englischen Litteratur*; Stopford A. Brooke, *English Literature, from the beginning to the Norman Conquest*; Henry Morley, *English Writers* (vols. i. and ii.).

**ANGLO-SAXON LAW.** Series of laws written in the vernacular, and unique among Teutonic peoples, were issued from the seventh century onwards by Æthelberht, Hlothhere, Eadric, and Withraed, Kings of Kent, by Ine, King of Wessex, by Alfred, Edward the Elder, Athelstan, Edmund, Edgar, Æthelred, and Canute, in addition to a number of important by-laws and regulations of various kinds, which bear no king's name. We hear, also, of laws issued by other kings which have been lost, and there must have been a considerable body of traditional law which was never committed to writing. What laws are extant, show us a society mainly agricultural, divided by birth into a noble, a free peasant, and a servile class. There was also a dependent class in Kent, intermediate between the freeman and the slave. The strongest social ties were those of the kindred, and the relationship between lord and man.

The laws were issued by the king and his counsellors. Cases were decided by the production of oaths which varied in value according to the rank of the swearer, or by the several forms of the ordeal. No distinction was made between civil and criminal law, and even homicide could be atoned for by payment of a sum varying according to the social status of the dead man. The object of the laws was to restrict private vengeance, to prevent and punish theft (primarily of cattle), to stop dishonest trading, to secure the persons and residences of the people, to enforce the mutual obligations of relatives, and masters and men, to provide adequate defence for the kingdom by means of garrisoned boroughs and a well-armed mounted infantry, to protect the helpless, and to safeguard the rights of the Church and its servants.

The early laws present considerable difficulty owing to their antiquity. The laws of Æthelberht are the earliest records in the English language, though, like many of the other laws, they are only preserved in a MS. of the twelfth century. The standard edition is Liebermann's *Gesetze der Angelsachsen* (Halle, A. S. Max Niemeyer).—BIBLIOGRAPHY: Pollock and Maitland, *History of English Law*; H. M. Chadwick, *Studies in Anglo-Saxon Institutions*.

**ANGO'LA.** A Portuguese territory in Western Africa, south of the Congo, extending from the sea to Rhodesia, and from about lat. 6° S. to lat. 17° S. (area, 484,800 sq. miles; pop. 5,000,000). It is a country of varied features, and its natural resources are of exceedingly large extent. The province is rich in malachite, copper, iron, petroleum, and salt; rubber supplies are becoming exhausted. The Coanza (Kwanza) is the largest river. The capital is the seaport of Loanda; other ports are Benguella (or Benguela) and Mossamedes. Three railways now run inland from these places. It exports coffee, hides, gum, rubber, wax, etc.

**ANGMERING.** Seaside resort of Sussex. It is 15 m. from Brighton on the Southern Rly. A modern place, it is known for its tennis tournaments, while there are other attractions for visitors. It has an interesting church.

**ANGOLA PEA** (*Cajānus indicus*). *See* PIGEON PEA.

**ANGO'NILAND.** A district of South Africa, lying to the west of the southern half of Lake Nyassa, and partly in Nyassaland Protectorate, partly in Rhodesia. It is a plateau

with an average height of 4000 feet, the name being derived from the Angoni, a race of mixed Zulu blood, who used to make murderous raids on their neighbours, and have given much trouble to the missionaries and others.

**ANGO'RA** (ancient **ANCY'RA**). A town in Asia Minor, 215 miles E.S.E. of Constantinople, with considerable remains of Byzantine architecture, and relics of earlier times, both Greek and Roman, such as the remnants of the Monumentum Ancyranum, raised in honour of the Emperor Augustus, and giving us much valuable information about his public life and work. All the animals of this region are long haired, especially the goats (*see* GOAT), sheep, and cats. This hair forms an important export as well as the fabric called camlet here manufactured from it; other exports being goats' skins, dye-stuffs, gums, honey and wax, etc. A railway connects it with Scutari. Pop. 32,000. By the Turkish Constitution which was passed in 1924 Angora became the headquarters of the Turkish Government, the meeting-place of the Grand National Assembly, and the capital of Turkey.

**ANGOSTU'RA,** or **CIUDAD BOLIVAR.** A city of Venezuela, capital of the province of Bolivar, on the Orinoco, about 240 miles from the sea, with governor's residence, a college, a handsome cathedral, and a considerable trade, steamers and sailing-vessels ascending to the town. Exports: gold, cotton, indigo, tobacco, coffee, cattle, etc.; imports: manufactured goods, wines, flour, etc. Pop. 17,535.

**ANGOSTURA BARK.** The aromatic bitter medicinal bark obtained chiefly from *Galipēa officinālis*, a tree 10 to 20 feet high, growing in the southern regions of South America; ord. Rutaceæ. The bark is valuable as a tonic and febrifuge, and is also used for a kind of bitters. From this bark being adulterated, and sometimes entirely replaced, by the poisonous bark of *Strychnos Nux-Vomica*, its use as a medicine has been almost given up.

**ANGOULÊME** (ăn-gō-lām). An ancient town of Western France, capital of department Charente, on the Charente, 60 miles N.N.E. of Bordeaux, on the summit of a rocky hill. It has a fine old cathedral, built in the twelfth century and restored 1875, a beautiful modern town hall built in 1858, a lyceum, public library, natural history museum, etc. There are manufactures of paper, woollens, and linens; distilleries, sugar-works, tanneries, etc. Calvin lived here for three years (1527-30). Pop. 38,211.

**ANGRA DO HEROISMO.** The chief seaport of Terceira, one of the Azores, with the only convenient harbour in the whole group. It has a cathedral, a military college and arsenal, etc., and is the residence of the Governor-General of the Azores, and of the foreign consuls. Pop. 10,057.

**ANGRA PEQUENA** (ăn'grà pekā'nà; Port. "little bay"). A bay on the coast of former German S.W. Africa, where the Bremen commercial firm Lüderitz in 1883 acquired a strip of territory and established a trading station. In 1884, notwithstanding some weak protests of the British, Germany took under her protection the whole coast territory from the Orange River to 26° S. lat., and soon after extended the protectorate to the Portuguese frontier, but not including the British settlement of Walvis Bay. Angra Pequena, called by the Germans Lüderitzbucht, was captured by the South African forces in Sept., 1915. *See* SOUTH-WEST AFRICA.

**ANGRI** (ăn'grē). A town of Southern Italy, 12 miles N.W. of Salerno, in the centre of a region which produces grapes, cotton, and tobacco in great quantities. In the vicinity of Angri, Teias, King of the Ostrogoths, was defeated by Narses. Pop. 11,574.

**ANGUILLA** (an-gwil'la). *See* EEL.

**ANGUILLA** (ang-gil'a), or **SNAKE ISLAND.** One of the British West India Islands, 60 miles N.E. of St. Kitts; about 20 miles long, with a breadth varying from 3 to 1½ miles; area, 35 sq. miles. A little sugar, cotton, tobacco, and maize is grown. There is a saline lake in the centre, which yields salt. Pop. 4230, of whom 100 are white.

**ANGUS.** A name of Forfarshire (q.v.), which in 1928 became the official name of the county.

**AN'HALT.** Formerly a duchy of North Germany, lying partly in the plains of the Middle Elbe, and partly in the valleys and uplands of the Lower Harz, and almost entirely surrounded by Prussia; area, 888 sq. miles. All sorts of grain, wheat especially, are grown in abundance; also flax, rape, potatoes, tobacco, hops, and fruit. Excellent cattle are bred. The inhabitants are principally occupied in agriculture, though there are some iron-works and manufactures of woollens, linens, beet-sugar, tobacco, etc.

**The dukes of Anhalt** traced their origin to Bernard (1170-1212), son of Albert the Bear. In time the family split up into numerous branches, and the territory was afterwards held by three dukes (Anhalt-Köthen, Anhalt-Bernburg, and Anhalt-Dessau). In 1863 the Duke of Anhalt-Dessau became sole heir to the three duchies. The united principality, incorporated in the German Empire, had one vote in the Bundesrath and two in the Reichstag. The executive power, previous to the changes resulting from the European War, was vested in the duke, and the legislative in a Diet of thirty-six members. The reigning duke in 1918 was Edward, who succeeded his brother on 21st April, 1918. With the outbreak of the revolution in Germany in 1918 Anhalt became a republic. The government is carried on by the Ministry of State. Pop. (1925), 351,045, almost all Protestants. The chief towns are Dessau, Bernburg, Köthen, and Zerbst.

**AN'HOLT.** An island belonging to Denmark, in the Kattegat, largely covered with drift-sand, and surrounded by dangerous banksand reefs. Pop. 300.

**ANHWEI.** *See* NGANHWEI.

**ANHY'DRIDE.** A chemical term synonymous with acidic oxide (*see* CHEMISTRY) and applied to those oxides which unite with water to form acids. They were formerly called *anhydrous acids*.

**ANHY'DRITE.** Anhydrous sulphate of calcium, a mineral presenting several varieties of structure and colour. The *vulpinite* of Italy possesses a granular structure, resembling a coarse-grained marble, and is used in sculpture. Its colour is greyish-white, intermingled with blue.

**ANI** (ä'nē). A ruined city in Armenia, formerly the residence of the Armenian dynasty of the Bagratidæ, having in the eleventh century a population of 100,000 and 1000 churches. In the thirteenth century it was taken by the Tartars, and was destroyed by an earthquake in 1319.

**ANICHE** (á-nēsh). A town or village in the French department Nord, arrondissement Douai, with coal mines, glass works, chemical works, etc. Pop. 6927.

**ANIENE** (à-nē-ā'nā). *See* ANIO.

**AN'ILINE,** $C_6H_5NH_2$. Is an extremely important substance as it forms the starting-point in the preparation of a large number of substances. It was first prepared by Unverdorben, in 1826, by distillation of indigo. Aniline is present in small quantity in coal-tar, and is prepared commercially from benzene by transforming it by means of nitric acid into nitro-benzene and reducing this with scrap-iron and hydrochloric acid. The substance can also be prepared by reducing nitro-benzene electrolytically.

It is a liquid of peculiar odour, boiling at 182° C., colourless when quite pure, but rapidly darkening in colour on standing, so that commercial aniline is usually dark-brown. It is a basic substance, and forms crystalline salts with acids. The salts, like aniline itself, become coloured on exposure to air. Aniline contains the characteristic chemical group $NH_2$, the amino group, and substances containing this group react with nitrous acid at 0° C., forming diazonium compounds; these combine readily with phenols, naphthols, and other amino compounds to form azo compounds, highly-coloured compounds, many of which are dyes.

Many dyes are prepared from aniline, e.g. rosaniline, magenta, methylene blue, aniline blue, etc., also some explosives, e.g. tetranitraniline, which is a powerful explosive prepared by nitrating aniline and the substance tetranitromethyaniline, "tetryl," used in detonators. Several medicinal substances are also prepared from aniline, for instance, antifebrin and atoxyl.

**AN'ILISM.** Aniline poisoning, a name given to the aggregate of symptoms which often show themselves in those employed in aniline works, resulting from the inhalation of aniline vapours. It may be either acute or chronic. In a slight attack of the former kind, the lips, cheeks, and ears become of a bluish colour, and the person's walk may be unsteady; in severe cases there is loss of consciousness. Chronic anilism is accompanied by derangement of the digestive organs and of the nervous system, headaches, eruptions on the skin, muscular weakness, etc.

**ANIMAL.** An organized and sentient living being. Life in the earlier periods of natural history was attributed almost exclusively to animals. With the progress of science, however, it was extended to plants. In the case of the higher animals and plants there is no difficulty in assigning the individual to one of the two great kingdoms of organic nature, but in their lowest manifestations the vegetable and animal kingdoms are brought into such immediate contact that it becomes almost impossible to assign them

precise limits, and to say with certainty where the one begins and the other ends. From *form* no absolute distinction can be fixed between animals and plants. Many animals, such as the sea-shrubs, sea-mats, etc., so resemble plants in external appearance that they were, and even yet popularly are, looked upon as such.

With regard to *internal structure* no line of demarcation can be laid down, all plants and animals being, in this respect, fundamentally similar; that is, alike composed of molecular, cellular, and fibrous tissues. Neither are the chemical characters of animal and vegetable substances more distinct. Animals contain in their tissues and fluids a larger proportion of nitrogen than plants, whilst plants are richer in carbonaceous compounds than the former. In some animals, moreover, substances almost exclusively confined to plants are found. Thus the outer wall of the Sea-squirts contains *cellulose*, a substance largely found in plant-tissues; whilst *chlorophyll*, the colouring-matter of plants, occurs in Hydra and many other lower animals. *Power of motion*, again, though broadly distinctive of animals, cannot be said to be absolutely characteristic of them. Thus many animals, as oysters, sponges, corals, etc., in their mature condition are rooted or fixed, while the embryos of many plants, together with numerous fully-developed forms, are endowed with locomotive power by means of vibratile, hair-like processes called cilia.

The distinctive points between animals and plants which are most to be relied on are those derived from the *nature and mode of assimilation of the food*. Plants feed on *inorganic matters*, consisting of water, ammonia, carbonic acid, and mineral matters. They can only take in food which is presented to them in a *liquid* or *gaseous* state. The exceptions to these rules are found chiefly in the case of plants which live *parasitically* on other plants or animals, in which cases the plant may be said to feed on organic matters represented by the juices of their hosts. Animals, on the contrary, require *organized* matters for food. They feed either upon plants or upon other animals. But even carnivorous animals can be shown to be dependent upon plants for subsistence; since the animals upon which Carnivora prey are in their turn supported by plants.

Animals, further, can subsist on *solid* food in addition to liquids and gases; but many animals (such as the Tapeworms) live by the mere imbibition of fluids which are absorbed by their tissues, such forms possessing no distinct digestive system. Animals require a due supply of *oxygen gas* for their sustenance, this gas being used in respiration. Plants, on the contrary, require *carbonic acid*. The animal exhales or gives out carbonic acid as the part result of its tissue-waste, whilst the plant, taking in this gas, is enabled to decompose it into its constituent carbon and oxygen. The plant retains the former for the uses of its economy, and liberates the oxygen, which is thus restored to the atmosphere for the use of the animal.

Animals receive their food into the interior of their bodies, and assimilation takes place in their internal surfaces. Plants, on the other hand, receive their food into their external surfaces, and assimilation is effected on the external parts, as is exemplified in the leaf-surfaces under the influence of sunlight. Cf. T. J. Parker and W. A. Haswell, *Text-Book of Zoology*; *Cambridge Natural History*.

**ANIMAL CHEMISTRY.** *See* CHEMISTRY.

**ANIMALCULE** (an-i-mal'kūl). A general name given to many forms of animal life from their minute size. The larger examples are just visible to the naked eye, but most of them are strictly microscopic. Some are pigmented, but the majority are colourless. The term is not applicable to a particular zoological type, but it is customary to confine it to the "Protozoa," "Rotifera," or "Wheel Animalcules."

**ANIMAL HEAT.** All animals possess a certain amount of heat or temperature which is necessary for the performance of vital action. The only classes of animals in which a constantly-elevated temperature is kept up are birds and mammals. The bodily heat of the former varies from 39.4° to 43.9° C., and of the latter from 35.5° to 40.5° C. The mean or average heat of the human body is about 99° F., and it never falls much below this in health. Below birds, animals are named "cold-blooded," this term meaning in its strictly physiological sense that their temperature is usually that of the medium in which they live, and that it varies with that of the surrounding medium. The temperature of "warm-blooded" animals is remarkably constant, although there are individual variations. In man this variation is slight, amounting only to fractions of a degree. The cause of the evolu-

tion of heat in the animal body is referred to the union (by a process resembling ordinary combustion) of the carbon and hydrogen of the system with the oxygen taken in from the air in the process of respiration.

**ANIMAL MAGNETISM.** *See* HYPNOTISM, MESMER.

**ANIMALS, Cruelty to.** An offence against which societies have been formed and laws passed in England and other countries. According to English law, if any person shall cruelly beat, illtreat, overdrive, abuse, or torture any domestic animal, he shall forfeit a sum not exceeding £5 for every such offence. Bull-baiting, cock-fighting, and the like are also prohibited. Provision is also made for the punishment of persons unlawfully and maliciously killing, maiming, or wounding cattle, dogs, birds, beasts, and other animals.

**ANIMAL WORSHIP.** A practice found to prevail, or to have prevailed, in the most widely-distant parts of the world, both the Old and the New, but nowhere to such an amazing extent as in ancient Egypt, notwithstanding its high civilization. Nearly all the more important animals found in the country were regarded as sacred in some part of Egypt, and the degree of reverence paid to them was such that throughout Egypt the killing of a hawk or an ibis, whether voluntary or not, was punished with death. The worship, however, was not, except in a few instances, paid to them as actual deities. The animals were merely regarded as sacred to the deities, and the worship paid to them was symbolical.

**AN'IMA MUN'DI.** *See* PANTHEISM.

**ANIMÉ** (an'i-me). A resin obtained from the trunk of an American tree (*Hymenæa Courbaril*). It is of a transparent amber colour, has a light, agreeable smell, and is soluble in alcohol. It strongly resembles copal, and, like it, is used in making varnishes. *See* COPAL.

**AN'IMISM.** The system of medicine propounded by Stahl, and based on the idea that the soul (*anima*) is the seat of life. In modern usage the term is applied to express the general doctrine of souls and other spiritual beings, and especially to the tendency, common among savage races, to attribute souls or spirits to inanimate things, and to explain phenomena not due to obvious natural causes by attributing them to spiritual agency. Amongst the beliefs of animism is that of a human apparitional soul, bearing the form and appearance of the body, and living after death a sort of semi-human life.—BIBLIOGRAPHY: Sir J. G. Frazer, *The Golden Bough*; Andrew Lang, *Myth, Ritual, and Religion*.

**ANIO** (now **ANIENE** or **TEVERONE**). A river in Italy, a tributary of the Tiber, which it enters from the east a short distance above Rome, renowned for the natural beauties of the valley through which it flows, and for the remains of ancient buildings there situated, as the villas of Mæcenas and the Emperor Hadrian.

**ANISE** (an'is; *Pimpinella Anī-Sum*). An annual plant of the nat. ord. Umbelliferæ, a native of Eastern Asia, Egypt, and the Mediterranean coasts, and cultivated in Spain, France, Italy, Malta, etc., whence the fruit, popularly called *aniseed*, is imported. This fruit is ovate, with ten narrow ribs, between which are oil-vessels. It has an aromatic smell and is largely employed to flavour liqueurs (aniseed or anisette), sweetmeats, etc. *Star-anise* is the fruit of an evergreen Asiatic tree (*Illicium anisātum*), nat. ord. Magnoliaceæ, and is brought chiefly from China. Its flavour is similar to that of anise, and it is used for the same purposes. An essential oil is obtained from both kinds of anise, and is used for scenting soaps and in the preparation of cordials.

**ANJOU** (ăn-zhö). An ancient province of France, now forming the department of Maine-et-Loire, and parts of the departments of Indre-et-Loire, Mayenne, and Sarthe; area, about 3000 sq. miles. In 1060 the province passed into the hands of the House of Gatinais, of which sprang Count Godfrey V., who, in 1127, married Matilda, daughter of Henry I. of England, and so became the ancestor of the Plantagenet kings. Anjou remained in the possession of the English kings up to 1204, when John lost it to the French king Philip Augustus. In 1226 Louis VIII. bestowed this province on his brother Charles; but in 1328 it was reunited to the French Crown. John I. raised it to the rank of a duchy, and gave it to his son Louis. Henceforth it remained separate from the French Crown till 1480, when it fell to Louis XI.

**ANKARSTRÖM** (ăn'kăr-streum). **Jan Jakob.** The murderer of Gustavus III. of Sweden was born about 1762, and was at first a page in the Swedish Court, afterwards an officer in the royal bodyguard. He was a strenuous opponent of the sovereign's measures to restrict the privileges of the nobility, and joined Counts Horn

and Ribbing in a plot to assassinate Gustavus. The assassination took place on 15th March, 1792. Ankarström was tried, tortured, and executed in April, dying boasting of his deed.

**ANKER.** An obsolete measure in Britain for spirits, beer, etc., containing 8¼ imperial gallons. A measure of similar capacity was used in Germany and elsewhere in Europe.

**AN'KLAM.** A town in Prussia, province of Pomerania, 47 miles north-west of Stettin, on the River Peene, which is here navigable. Shipbuilding, woollen and cotton manufactures, soap-boiling, tanning, etc., are carried on. Pop. 15,280.

**ANKLE.** Joint that unites the leg with the foot. It is a hinge joint with three ligaments, anterior, internal and external. It articulates between the two bones of the leg, the tibia and the fibula.

Bearing, as it must at times, the whole weight of the body, the ankle is very strong but nevertheless sprains and dislocations are frequent.

**ANKO'BAR,** or **ANKO'BER.** A town in Abyssinia, former capital of Shoa, on a steep conical hill 8200 feet high. Pop. 2000.

**ANKYLO'SIS,** or **ANCHYLO'SIS.** Stiffness of the joints caused by a more or less complete coalescence of the bones through ossification, often the result of inflammation or injury. False ankylosis is stiffness of a joint when the disease is not in the joint itself, but in the tendinous and muscular parts by which it is surrounded.

**ANKYLOSTOMI'ASIS.** A "worm disease" to which miners are subject in some localities, is caused by vast numbers of small parasitic worms (*Ankylostoma* or *Anchylostoma duodenale*) in the duodenum or upper portions of the intestinal canal. Deriving their sustenance from the system, these worms produce anæmia or bloodlessness (that is, deficiency of the red corpuscles of the blood), the sufferers being pallid, feeble, short-breathed, liable to faint, and unequal to any laborious work, and death may result if a cure is not effected. Fortunately the disease is not difficult to cure if the remedies are applied—remedies such as will expel the worms from the intestine. The disease is said to be common in tropical and sub-tropical countries all over the world.

In Europe is was perhaps first observed in 1879 in the case of workmen engaged in excavating the St. Gothard tunnel. Since 1896 it has been well known in some of the German mines; and in 1903 it was detected among the miners engaged in the Dolcoath mine in Cornwall. The eggs of the worms are carried from the body with the fæces; under favourable circumstances they develop into larvæ, which may gain entrance again into the human body by the mouth (perhaps in drinking-water), to attain full development in the intestine. Careful sanitary arrangements are a preventive of the disease, which is also known as "miner's worm," "miner's anæmia," etc.

**ANN, or ANNAT.** In Scottish law, the half-year's stipend of a living, after the death of the clergyman, payable to his family or next of kin. The right to the ann is not vested in the clergyman himself, but in his representatives; and, accordingly, it can neither be disposed of by him nor attached for his debts.

**ANNA.** An Anglo-Indian money of account, the sixteenth part of a rupee, and of the value of one penny; it is divided into four pice.

**AN'NABERG.** A town in Saxony, 47 miles south-west of Dresden. Mining (for silver, cobalt, iron, etc.) is carried on, and there are manufactures of lace, ribbons, fringes, buttons, etc. Pop. 17,025.

**ANNA COMNE'NA.** Daughter of Alexius I., Comnenus, Byzantine emperor. She was born 1083, and died 1148. After her father's death she endeavoured to secure the succession for her husband, Nicephorus Briennius, but was baffled by his want of energy and ambition. She wrote (in Greek) a life of her father Alexius (*The Alexiad*, a work in fifteen books). She is a character in Sir Walter Scott's *Count Robert of Paris*.

**ANNA IVANOV'NA.** Empress of Russia, born in 1693, the daughter of Ivan, the elder half-brother of Peter the Great. She was married in 1710 to the Duke of Courland, in the following year was left a widow, and in 1730 ascended the throne of the tsars on the condition proposed by the senate, that she would limit the absolute power of the tsars, and do nothing without the advice of the council composed of the leading members of the Russian aristocracy. But no sooner had she ascended the throne than she declared her promise null, and proclaimed herself autocrat of all the Russias. She chose as her favourite Ernest John von Biren or Biron, who was soon all-powerful in Russia, and ruled with great severity. Several of the leading nobles were executed, and many thousand men

exiled to Siberia. In 1737 Anna forced the Courlanders to choose Biren as their duke, and nominated him at her death regent of the empire during the minority of Prince Ivan (of Brunswick). Anna died in 1740. *See* BIREN.

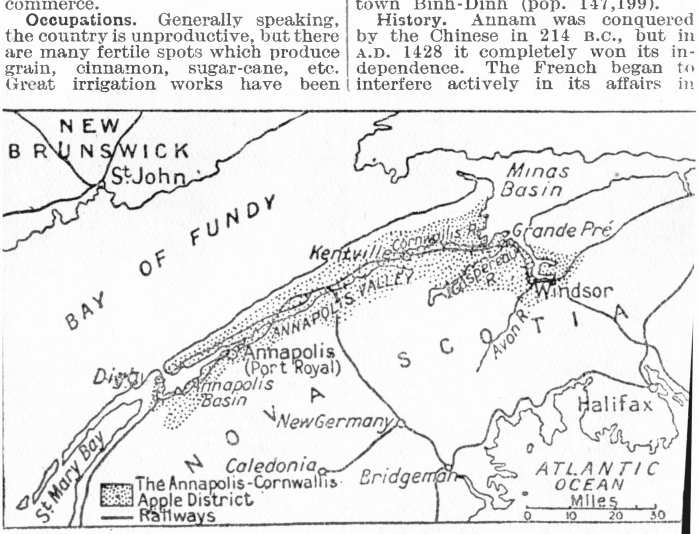
**AN'NALS.** A history of events in chronological order, each event being recorded under the year in which it occurred. The name is derived from the first annual records of the Romans, which were called *annāles pontificum* or *annāles maximi*, drawn up by the *pontifex maximus* (chief pontiff). The practice of keeping such annals was afterwards adopted also by various private individuals, as by Fabius Pictor, Calpurnius Piso, and others. The name hence came to be applied in later times to historical works in which the matter was treated with special reference to chronological arrangement, as to the *Annals* of Tacitus.

**ANNAM'.** A French protectorate in S.E. Asia, between Tongking and Cochin-China, having a coast-line of 750 miles, an area of 39,758 sq. miles, and a population in 1926 of 5,580,974, including 2584 Europeans and a large military force. There are commodious harbours all along the coast, and the ports of Tourane, Qui-Nhon, and Xuan Day are open to European commerce.

**Occupations.** Generally speaking, the country is unproductive, but there are many fertile spots which produce grain, cinnamon, sugar-cane, etc. Great irrigation works have been undertaken, especially on the Phan-rang River (which irrigates 10,000 acres) and in Central Annam. Rice is the chief product. Agriculture is the chief occupation, but many natives are employed in spinning and weaving cotton and silk, in preparing varnish, and in building junks. Timber of excellent quality abounds, cattle-rearing is an important industry, and copper, zinc, gold, iron, and coal are all worked. Salt is mined in North, Central, and South Annam. The value of imports in 1926 was 67,468,123 francs, and of exports 96,775,317 francs. The chief exports were sugar, rice, cotton and silk tissues, tea, paper, cinnamon and other spices; while the principal imports were cottons, cotton-yarn, tea, tobacco, and petroleum.

**People.** The Annamese are the predominant people in Annam, Tongking, South Cambodia, and Cochin-China. They are the ugliest of the Mongolian races, and their physical development is poor. Their language, allied to Chinese, is monosyllabic, and the same word may express widely different meanings in accordance with the tone of voice in which it is uttered. Buddhism is the prevalent religion, though the educated classes tend to Confucianism. The chief port is Tourane, the capital Hué (pop. 60,611), and the largest town Binh-Dinh (pop. 147,199).

**History.** Annam was conquered by the Chinese in 214 B.C., but in A.D. 1428 it completely won its independence. The French began to interfere actively in its affairs in




The Annapolis Valley
A great part of this valley is given up to the growing of Apples

1847 on the plea of protecting the native Christians. By the treaties of 1862 and 1867 they obtained the southern and most productive part of Cochin-China, subsequently known as French Cochin-China; and in 1874 they obtained large powers over Tonking, notwithstanding the protests of the Chinese. Finally, in 1883, Tonking was ceded to France, and next year Annam was declared a French protectorate. After a short period of hostilities with China the latter recognized the French claims. There is a native king who governs the country, assisted by a Council of Ministers, in accordance with the wishes of the French Government as expressed by a Resident Superieur. Since 1926 there has been a Chamber of Representatives of the people.—BIBLIOGRAPHY: F. R. Eberhardt, *Guide de l'Annam*; C. Madrolle, *Indo-Chine du Nord*: *Tonkin, Annam, Laos*; A. Maybon, *Histoire d'Annam*.

**ANNAMABOE** (-bō'). A seaport in Western Africa, on the Gold Coast, 10 miles east of Cape Coast Castle, with some trade in gold-dust, ivory, palm-oil, etc. Pop. about 5000.

**AN'NAN.** A royal and police borough in Scotland, on the Annan, a little above its entrance into the Solway, one of the Dumfries district of burghs. Pop. (1931), 3959.

**The River Annan** is a stream 40 miles long running through the central division of Dumfriesshire, to which it gives the name of **Annandale.**

**ANNAP'OLIS.** The capital of Maryland, United States, on the Severn, near its mouth in Chesapeake Bay. It contains a college (St. John's), a state-house, and the United States Naval Academy. Pop. (1920), 11,214.

**ANNAP'OLIS.** A small town in Nova Scotia, on an inlet of the Bay of Fundy, with an important traffic by railway and steamboat. It is one of the oldest European settlements in America, dating from 1604.

**ANN ARBOR.** A town of Michigan, United States, on the Huron River, about 40 miles west of Detroit; the seat of the State university. It has flour-mills, and it manufactures woollens, iron, and agricultural implements. Pop. 19,516.

**ANNATES** (an'nāts). A year's income claimed for many centuries by the Pope on the death of any bishop, abbot, or parish priest, to be paid by his successor. In England they were at first paid to the Archbishop of Canterbury, but were afterwards appropriated by the Popes. In 1532 the Parliament gave them to the Crown; but in 1703 Queen Anne restored them to the Church by applying them to the augmentation of poor livings. *See* QUEEN ANNE'S BOUNTY.

Annatto (*Bixa Orellana*)

**ANNAT'TO, or ANNATO.** An orange-red colouring matter, obtained from the pulp surrounding the seeds of *Bixa Orellăna*, a shrub native to tropical America, and cultivated in Guiana, St. Domingo, and the East Indies. It is sometimes used as a dye for silk and cotton goods, though it does not produce a very durable colour, but it is much used in medicine for tinging plasters and ointments, and to a considerable extent by farmers for giving a rich colour to milk, butter, and cheese. The colour given by annatto approaches very nearly the natural colouring matter of milk fat. It is guaranteed to preserve the same colour throughout the year, and is considered to be a legitimate colouring matter.

**ANNE.** Queen of Great Britain and Ireland, was born at Twickenham, near London, 6th Feb., 1664. She was the second daughter of James II., then Duke of York, and Anne, his wife, daughter of the Earl of Clarendon. With her father's permission she was educated according to the principles of the English Church. In 1683 she was married to Prince George, brother of King Christian V. of Denmark. On the arrival of the Prince of Orange in 1688, Anne wished to remain with her father; but she was prevailed upon by Lord Churchill (afterwards Duke of Marlborough) and his wife to join the triumphant party. After the death of William III. in 1702 she ascended the English throne. Her character

was essentially weak, and she was governed first by Marlborough and his wife, and afterwards by Mrs. Masham.

Most of the principal events of her reign are connected with the war of the Spanish Succession. The only important acquisition that England made by it was Gibraltar, which was captured in 1704. Another very important event of this reign was the union of England and Scotland under the name of Great Britain, which was accomplished in 1707. Anne seems to have long cherished the wish of securing the succession to her brother James, but this was frustrated by the internal dissensions of the cabinet. Grieved at the disappointment of her secret wishes, she fell into a state of weakness and lethargy, and died, 20th July, 1714.

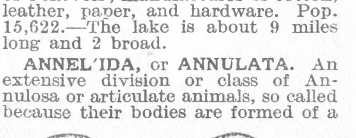
The reign of Anne was distinguished not only by the brilliant successes of the British arms, but also on account of the number of admirable and excellent writers who flourished at this time, among whom were Pope, Swift, and Addison. Anne bore her husband many children, all of whom died in infancy, except one son, the Duke of Gloucester, who died at the age of twelve.

**ANNE** (of Austria). Daughter of Philip III. of Spain, was born at Madrid in 1602, and in 1615 was married to Louis XIII. of France. Richelieu, fearing the influence of her foreign connections, did everything he could to humble her. In 1643 her husband died, and she was left regent, but placed under the control of a council. But the Parliament overthrew this arrangement, and entrusted her with full sovereign rights during the minority of her son Louis XIV. Having brought upon herself the hatred of the nobles by her boundless confidence in Cardinal Mazarin, she was forced to flee from Paris during the wars of the Fronde. She ultimately quelled all opposition, and was able in 1661 to transmit to her son unimpaired the royal authority. She spent the remainder of her life in retirement, and died 20th Jan., 1666.

**ANNEALING** (an-ēl'ing). A process to which many articles of metal and glass are subjected after making, in order to render them more tenacious and which consists in heating them and allowing them to cool slowly. When the metals are worked by the hammer, or rolled into plates, or drawn into wire, they acquire a certain amount of brittleness, which destroys their usefulness, and has to be remedied by annealing. The tempering of steel is one kind of annealing. Annealing is particularly employed in glasshouses, and consists in putting the glass vessels, as soon as they are formed and while they are yet hot, into a furnace or oven, in which they are suffered to cool gradually. The toughness is greatly increased by cooling the articles in oil.

**ANNECY** (an-sē). An ancient town in France, department of Haute-Savoie, situated on the Lake of Annecy, 21 miles S. of Geneva; contains a cathedral and a ruinous old castle once the residence of the counts of Genevois; manufactures of cotton, leather, paper, and hardware. Pop. 15,622.—The lake is about 9 miles long and 2 broad.

**ANNEL'IDA, or ANNULATA.** An extensive division or class of Annulosa or articulate animals, so called because their bodies are formed of a



Lobworm (one of the Annelida)

great number of small rings, the outward signs of internal segmentation. The earth-worm, the lobworm, the nereis, and the leech belong to this division. They have red, rarely yellow or green, blood circulating in a double system of contractile vessels, a double ganglionated nervous cord, and respire by external branchiæ, internal vesicles, or by the skin. Their organs of motion consist of bristles or *setæ*, which are usually attached to the lateral surfaces of each segment, the bristles being borne on "foot processes" or *parapodia*. The number of body segments varies. As many as 400 may be found in some sea-worms. A complete digestive system is developed, consisting of a mouth—armed with horny jaws and a protrusible proboscis—gizzard, stomach, and intestine. *See* EARTH-WORM, LEECH, etc.

**ANNEXATION.** A term applied to the acquisition by a State of territory previously belonging to another Power, or independent. It is applicable not only to the extension of a State's sovereignty over adjoining territory, but also to an acquisition of a remote territory. The inhabitants of the annexed territory are absolved from their allegiance to their former sovereign. Such annexations in modern history were those of Alsace-Lorraine by Germany in 1871, of California by the United States, of Bosnia and Herzegovina by Austria in 1908, and of the Boer Republics by Great Britain.

**ANNFIELD PLAIN.** A straggling colliery town (urban district) of England, Durham, about 7 miles south-west of Gateshead. Pop. (1931), 15,922.

**ANNOBON'**, or **ANNOBOM.** A beautiful Spanish island of Western Africa, south of the Bight of Biafra, about 4 miles long by 2 miles broad, and rising abruptly to the height of 3000 feet, richly covered with vegetation. Pop. 2000.

**ANNONAY** (ân-o-nā). A town in southern France, department of Ardèche, 37 miles S.S.W. of Lyons, in a picturesque situation. It is the most important town of Ardèche, manufacturing paper and glove leather to a large extent, also cloth, felt, silk stuffs, gloves, hosiery, chemical manures, glue, gelatine, brushes, chocolate, and candles. There is an obelisk in memory of Joseph Montgolfier of balloon fame. Pop. 16,660.

**AN'NUAL.** In botany, a plant that springs from seed, grows up, produces seed, and then dies, all within a single year or season. Among annual grasses may be noted all our cereals, barley, wheat, rye, and oats.

**AN'NUAL.** In literature, the name given to a class of publications which at one time enjoyed an immense yearly circulation, and were distinguished by great magnificence both of binding and illustration, which rendered them much sought after as Christmas and New Year presents. Their contents were chiefly prose tales and ballads, lyrics, and other poetry. The earliest was the *Forget-me-not*, started in 1822, and followed next year by the *Friendship's Offering*. The *Literary Souvenir* was commenced in 1824, and the *Keepsake* in 1827. Among the names of the editors occur those of Alaric A. Watts, Mrs. S. C. Hall, Harrison Ainsworth, Lady Blessington, Mary Howitt, etc. The popularity of the annuals reached its zenith about 1829, when no less than seventeen made their appearance; in 1856 the *Keepsake*, the last of the series, ceased to exist.

**ANNUAL REGISTER.** An English publication commenced in 1758 by Dodsley, the publisher, and since continued in yearly volumes down to the present day. There was also an *Edinburgh Annual Register*, the historical part of which was for several years contributed by Sir Walter Scott and afterwards by Robert Southey. It commenced in 1808 and came to a close in 1827.

**ANNU'ITY.** A periodical payment, made annually, or at more frequent intervals, and continuing either a certain number of years, or for an uncertain period, to be determined by a particular event, as the death of the recipient or annuitant, or that of the party liable to pay the annuity; or the annuity may be perpetual. An annuity is usually raised by the present payment of a certain sum as a consideration whereby the party making the payment, or some other person named by him, becomes entitled to an annuity, and the rules and principles by which this present value is to be computed have been the subjects of careful investigation.

The present value of a perpetual annuity is evidently a sum of money that will yield an interest equal to the annuity, and payable at the same periods; and an annuity of this description, payable quarterly, will evidently be of greater value than one of the same amount payable annually, since the annuitant has the additional advantage of the interest on three of the quarterly payments until the expiration of the year. In other words, it requires a greater present capital to be put at interest to yield a given sum per annum, payable quarterly, than to yield the same annual sum payable at the end of each year. The present value of an annuity for a limited period is a sum which, if put at interest, will at the end of that period give an amount equal to the sum of all the payments of the annuity and interest; and, accordingiy, if it be proposed to invest a certain sum of money in the purchase of an annuity for a given number of years, the comparative value of the two may be precisely estimated, the rate of interest being given.

But annuities for uncertain periods, and particularly life annuities, are more frequent, and the value of the annuity is computed according to the probable duration of the life by which it is limited. Such annuities are often created by contract, whereby the Government or a private annuity office agrees, for a certain sum advanced by the purchaser, to pay a certain sum in yearly, quarterly, or other periodical payments to the person advancing the money, or to some other named by him, during the life of the annuitant. Or the annuity may be granted to the annuitant during the life of some other person, or during two or more joint lives, or during the life of the longest liver or survivor among a number of persons named.

If a person having a certain capital, and intending to spend this capital and the income of it during his own life, could know precisely how long

he should live, he might lend his capital at a certain rate during his life, and by taking every year, besides the interest, a certain amount of the capital, he might secure the same annual amount for his support during his life in such manner that he should have the same sum to spend every year, and consume precisely his whole capital during his life. But since he does not know how long he is to live, he agrees with the Government or an annuity office to take the risk of the duration of his life, and they agree to pay him a certain annuity for life in exchange for the capital which he proposes to invest in this way. The probable duration of his life therefore becomes a subject of computation; and for the purpose of making this calculation tables of longevity are made by noting the proportion of deaths at certain ages in the same country or district.

Founding on a comparison of many such tables, the British Government has empowered the Postmaster-General to grant annuities at the following rates, which are probably more closely adjusted to their actual value than those of insurance companies and other dealers in annuities: To secure an immediate annuity of £100, the cost is, for males of 20 years, £2279 3*s.* 4*d.*; for females of same age, £2482 10*s.*; for males of 30 years, £2045 8*s.* 4*d.*; for females, £2258 6*s.* 8*d.*; for males of 40 years, £1789 6*s.* 8*d.*; for females, £1990; for males of 60, £1148 6*s.* 8*d.*; females, £1275 8*s.* 4*d.*; and so on.

**Deferred** annuities, that is, such as have their first payments postponed for a greater or less number of years, are also granted. We give the rates for an annuity of £100 deferred 20 years: Males aged 20, £848 6*s.* 8*d.*; females, £1014 13*s.* 4*d.*; males aged 35, £557 1*s.* 8*d.*; females, £697 1*s.* 8*d.*; and so on. If a person on whose life the deferred annuity is to depend should die before payment commences, the purchase-money may be returned to his or her representatives, provided that an agreement to that effect had been made in the first instance, but in this case the purchase-money is necessarily higher. *See* INSURANCE.—BIBLIOGRAPHY: Baily, *Life Annuities and Assurances*; J. Henry, *Government Life Annuity Commutation Tables.*

**ANNULOI'DA.** One of Professor Huxley's eight primary groups, a division (sub-kingdom) of animals, including the Rotifera, Scolecida (tapeworms, etc.), all which are more or less ring-like in appearance, and the Echinodermata, whose embryos show traces of annulation.

**ANNULO'SA.** A division (sub-kingdom) of animals regarded by some as synonymous with the Arthropoda or Articulata; according to other systematists, including both the Articulata and Annulata or worms.

**ANNUNCIATION.** The declaration of the angel Gabriel to the Virgin Mary informing her that she was to become the mother of our Lord.

**Annunciation** or **Lady Day** is a feast of the Church in honour of the annunciation, celebrated on the 25th of March.

The Italian order of **Knights of the Annunciation** was instituted by Amadeus VI., Duke of Savoy, in 1360. The king is always grand-master. The knights must be of high rank, and must already be members of the order of St. Mauritius and St. Lazarus. The decoration of the order consists of a golden shield suspended from a chain or collar of roses and knots, the letters F. E. R. T. being inscribed on the roses, and standing for *Fortitudo ejus Rhodum tenuit* (its bravery held Rhodes).

There are two orders of **Nuns of the Annunciation**, one originally French, founded in 1501 by Joanna of Valois; the other Italian, founded in 1604 by Maria Vittoria Fornari of Genoa.

**ANNUNZIO** (ân-nunt'syō), **Gabriele d'.** Italian poet, novelist, and dramatist, born at Pescara in 1863, his patronymic being Rapagnetta. He was educated at Prato and in Rome, and early took to literature and journalism. In 1898 he was elected a member of the Italian Chamber of Deputies, in which he joined the Socialist party.

**Works.** He came before the public when a schoolboy with a volume of verse called *Primo Vere*, to which others—naturally much more mature—were subsequently added. Several of his novels have been published in English, as: *The Child of Pleasure*, *The Victim*, *The Triumph of Death*, *The Virgin of the Rocks*, *The Fire of Life*. Some of these have been very successful, though disfigured to some extent by coarse realism and voluptuousness. He began to write plays later in life. Among them *Gioconda*, *The Dead City*, and *Francesca da Rimini* may be read in English versions, and *Gioconda* and *Francesca* have been performed on the English stage. His more recent works include: *Le Martyr de Saint Sebastien* (1911), *Le Chèvrefeuille* (1914), *La Beffa di Buccari* (1918), *Notturno* (1918).

D'Annunzio is the most prominent Italian writer of the present day, and in wealth of language and distinction

of style stands far ahead of all others. He served in the European War from 1915-18, and was wounded. In Sept., 1919, he led a raid and occupied the port of Fiume. He was created Prince of Nevoso in 1924.

**AN'OA.** An animal (*Anoa depressicornis*) closely allied to the buffalo, about the size of an average sheep, very wild and fierce, inhabiting the rocky and mountainous localities of the Island of Celebes. The horns are straight, thick at the root, and set nearly in a line with the forehead.

**ANO'BIUM.** A genus of coleopterous insects, the larvæ of which often do much damage by their boring into old wood. By means of their heads they produce a loud, ticking sound in the wood, the so-called *death-watch* ticking. *A. striātum*, a common species, when frightened, is much given to feigning death.

**AN'ODE** (Gr. *ana*, up, *hodos*, way). The positive pole of the voltaic current, being that part of the surface of a decomposing body which the electric current enters: opposed to *cathode* (Gr. *kata*, down, *hodos*, way), the way by which it departs.

**AN'ODON, or ANODON'TA.** A genus of lamellibranchiate bivalves, including the fresh-water mussels, without or with very slight hinge-teeth. *See* MUSSEL.

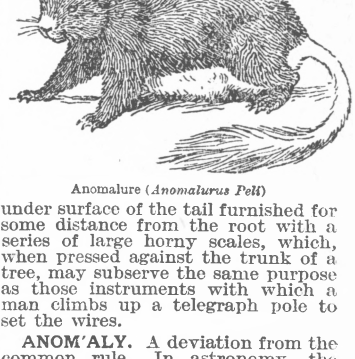
**AN'ODYNE.** A medicine, such as an opiate or narcotic, which allays pain.

**ANOINTING.** Rubbing the body or some part of it with oil, often perfumed. From time immemorial the nations of the East have been in the habit of anointing themselves for the sake of health and beauty. The Greeks and Romans anointed themselves after the bath. Wrestlers anointed themselves in order to render it more difficult for their antagonists to get hold of them. In Egypt it was common to anoint the head of guests when they entered the house where they were to be entertained.

In the Mosaic law a sacred character was attached to the anointing of the garments of the priests, and things belonging to the ceremonial of worship. The Jewish priests and kings were anointed when inducted into office, and were called the *anointed of the Lord*, to show that their persons were sacred and their office from God. In the Old Testament also the prophecies respecting the Redeemer style him *Messias*, that is, the *Anointed* which is also the meaning of his Greek name Christ.

The custom of anointing still exists in the Roman Catholic Church in the ordination of priests and the confirmation of believers and the sacrament of extreme unction. The ceremony is also frequently a part of the coronation of kings.

**ANOM'ALURE** (*Anomalūrus*). A genus of rodent animals inhabiting the west coast of Africa, resembling the flying-squirrels, but having the



Anomalure (*Anomalurus Pelii*)

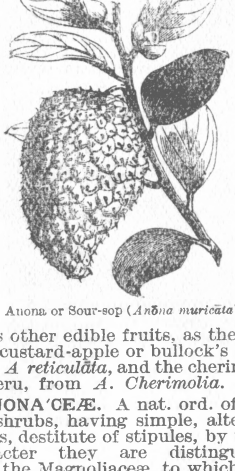
under surface of the tail furnished for some distance from the root with a series of large horny scales, which, when pressed against the trunk of a tree, may subserve the same purpose as those instruments with which a man climbs up a telegraph pole to set the wires.

**ANOM'ALY.** A deviation from the common rule. In astronomy, the angle which a line drawn from a planet to the sun has passed through since the planet was last at its perihelion or nearest distance to the sun. The *anomalistic year* is the interval between two successive times at which the earth is in perihelion, or 365 days 6 hours 13 minutes 48 seconds. In consequence of the advance of the earth's perihelion among the stars in the same direction as the earth's motion, and of the precession of the equinoxes, which carries the equinoxes back in the opposite direction to the earth's motion, the anomalistic year is about 4 minutes 40 seconds longer than the sidereal year, and about 25 minutes longer than the tropical or common year. The time of a complete revolution of the perihelion is computed at 108,000 years.

**ANOMU'RA.** A section of the crustaceans of the ord. Decapoda, with irregular tails not formed to assist in swimming, including the hermit-crabs and others.

**ANO'NA.** A genus of plants, the type of the nat. ord. Anonaceæ. *A. squamōsa* (sweet-sop) grows in the West Indian Islands, and yields an edible fruit having a thick, sweet, luscious pulp. *A. muricāta* (sour-sop) is cultivated in the West and East Indies; it produces a large pear-shaped fruit, of a greenish

colour, containing an agreeable slightly-acid pulp. The genus pro-



Anona or Sour-sop (*Anŏna muricāta*)

duces other edible fruits, as the common custard-apple or bullock's heart, from *A reticulāta*, and the cherimoyer of Peru, from *A. Cherimolia*.

**ANONA'CEÆ.** A nat. ord. of trees and shrubs, having simple, alternate leaves, destitute of stipules, by which character they are distinguished from the Magnoliaceæ, to which they are otherwise closely allied. They are mostly tropical plants of the Old and the New World, and are generally aromatic. *See* ANONA.

**ANOPLOTHE'RIUM.** An extinct genus of the Ungulata or Hoofed Quadrupeds, forming the type of a distinct family, which were in many respects intermediate between the swine and the true ruminants. These animals were pig-like in form, but possessed long tails, and had a cleft hoof, with two rudimentary toes. Some of them were as small as a guinea-pig, others as large as an ass. Six incisors, two canines, eight premolars, and six molars existed in each jaw, the series being continuous, no interval existing in the jaw. *A. commūne*, from the Eocene rocks, is a familiar species.

**ANOPLU'RA.** An order of apterous insects, of which the type is the genus Pedicŭlus or louse.

**ANOPSHEHR.** *See* ANUPSHAHR.

**ANOREXIA.** *See* APPETITE.

**ANOS'MIA.** A disease consisting in a diminution or destruction of the power of smelling, sometimes constitutional, but most frequently caused by strong and repeated stimulants, as snuff, applied to the olfactory nerves.

**ANOURA.** *See* ANURA.

**ANQUETIL-DUPERRON** (ânk-tēl-dü-pā-roṅ), **Abraham Hyacinthe.** A French orientalist, born 1731, died 1805. He studied theology for some time, but soon devoted himself to the study of Hebrew, Arabic, and Persian. His zeal for the Oriental languages induced him to set out for India, where he prevailed on some of the Parsee priests to instruct him in the Zend and Pehlevi and to give him some of the Zoroastrian books. In 1762 he returned to France with a valuable collection of MSS. In 1771 he published his *Zend-Avesta*, a translation of the *Vendidad*, and other sacred books, which aroused much interest. Among his other works are *L'Inde en rapport avec l'Europe* (1790), and a selection from the *Vedas*. His knowledge of the Oriental languages was by no means exact.

**ANSBACH.** *See* ANSPACH.

**AN'SELM, St.** A celebrated Christian philosopher and theologian, born at Aosta, in Piedmont, in 1033, died at Canterbury 1109. At the age of twenty-seven (1060) he became a monk at Bec, in Normandy, whither he had been attracted by the celebrity of Lanfranc. Three years later he was elected prior, and in 1078 he was chosen abbot, which he remained for fifteen years. During this period of his life he wrote his first philosophical and religious works: the dialogues on *Truth and Free-will*, and the treatises *Monologion* and *Proslogion*; and at the same time his influence made itself so felt among the monks under his charge that Bec became the chief seat of learning in Europe.

In 1093 Anselm was offered by William Rufus the archbishopric of Canterbury, and accepted it, though with great reluctance, and with the condition that all the lands belonging to the see should be restored. William II. soon quarrelled with the archbishop, who would show no subservience to him, and would persist in acknowledging Pope Urban II. in opposition to the antipope Clement. William ultimately had to give way. He acknowledged Urban as Pope, and conferred the pallium upon Anselm. The king became his bitter enemy, however, and so great were Anselm's difficulties that in 1097 he set out for Rome to consult with the Pope. Urban received him with great distinction, but did not venture really to take the side of the prelate against the king, though William had refused to receive Anselm again as archbishop, and had seized on the revenues of the see of Canterbury, which he retained till his death in 1100. Anselm accordingly remained abroad, where he wrote most of his celebrated

treatise on the atonement, entitled *Cur Deus Homo* (*Why God was made Man*). When William was succeeded by Henry I. Anselm was recalled; but Henry insisted that he should submit to be reinvested in his see by himself, although the Popes claimed the right of investing for themselves alone. Much negotiation followed, and Henry did not surrender his claims till 1107, when Anselm's long struggle on behalf of the rights of the Church came to an end.

Anselm was a great scholar, a deep and original thinker, and a man of the utmost saintliness and piety. Anselm's great achievement in philosophy was his ontological argument for the existence of God; and his importance in the ecclesiastical history of England cannot be exaggerated. The chief of his writings are the *Monologion*, the *Proslogion*, and the *Cur Deus Homo*. The first is an attempt to prove inductively the existence of God by pure reason without the aid of Scripture or authority; the second is an attempt to prove the same by the deductive method; the *Cur Deus Homo* is intended to prove the necessity of the incarnation. Among his numerous other writings are more than 400 letters. His life was written by his domestic chaplain and companion, Eadmer, a monk of Canterbury, and is edited by M. Rule for the "Rolls Series." *See* SCHOLASTICISM. Cf. Père Ragey, *Histoire de Saint Anselme*; J. M. Rigg, *Anselm of Canterbury*.

**ANS'GAR,** or **ANSHAR.** Called the *Apostle of the North*, born in 801 in Picardy, died in 864 or 865. He took the monastic vows while still in his boyhood, and in the midst of many difficulties laboured as a missionary in Denmark and Sweden. He died with the reputation of having made, if not the first, the most successful attempts to propagate Christianity in the North.

**AN'SON, George, Lord.** Celebrated English navigator, born 1697, died 1762. He entered the navy at an early age and became a commander in 1722, and captain in 1724. He was for a long time on the South Carolina station. In 1740 he was made commander of a fleet sent to the South Sea, directed against the trade and colonies of Spain. The expedition consisted of five men-of-war and three smaller vessels, which carried 1400 men. After much suffering and many stirring adventures he reached the coast of Peru, made several prizes, and captured and burned the city of Paita. His squadron was now reduced to one ship, the *Centurion*, but with it he took the Spanish treasure galleon from Acapulco, and arrived in England in 1744 with treasure to the amount of £500,000, having circumnavigated the globe.

His adventures and discoveries are described in the well-known *Anson's Voyage*, compiled from materials furnished by Anson. A few days after his return he was made rear-admiral of the blue, and not long after rear-admiral of the white. His victory over the French admiral Jonquière, near Cape Finisterre in 1747, raised him to the peerage, with the title of Lord Anson, Baron of Soberton. Four years afterwards he was made First Lord of the Admiralty. In 1758 he commanded the fleet before Brest, protected the landing of the British at St. Malo, Cherbourg, etc., and received the repulsed troops into his vessels. Finally, in 1761, he was appointed to convey the queen of George III. to England.

**ANSO'NIA.** A town of the United States, Conn., on the Nangatuck, with manufactures of brass and copper, and especially clocks. Pop. 17,643.

**ANSPACH** (ăn'spăh), or **ANSBACH.** A town in Bavaria, at the junction of the Holzbach with the Lower Rezat, 24 miles south-west of Nürnberg. An pach gave its name to an ancient principality or margravate, which had a territory of about 1300 sq. miles, with 300,000 inhabitants, in the end of the eighteenth century. The last margrave sold his possessions in 1791 to Prussia. It was occupied by the French in 1806, and transferred by Napoleon to Bavaria. The town has manufactures of trimmings, buttons, straw-wares, etc. Pop. 19,995.

**AN'STED, David Thomas.** An English geologist, born 1814, died 1880. He was professor of geology at King's College, London, and assistant-secretary to the Geological Society, whose quarterly journal he edited for many years.

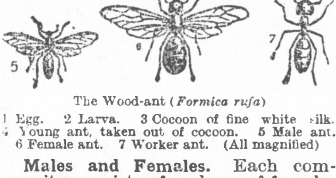
**AN'STER, John, LL.D.** Professor of civil law in the University of Dublin, born in County Cork, 1793, died 1867. He published a volume of poems, but is chiefly known by his fine translation of Goethe's *Faust*, Part I., 1835; Part II., 1864.

**AN'STEY, Christopher.** An English poet, born 1724, died 1805. He was author of *The New Bath Guide*, a humorous and satirical production describing fashionable life at Bath in the form of a series of letters in different varieties of metre, which had a great reputation in its day, but is now almost forgotten.

**ANSTRUTHER, Easter and Wester.** Formerly two royal burghs in Fife-

shire, Scotland. They were united in 1929 with Kilrenny, and now form one royal burgh called Kilrenny. The burgh includes Cellardyke, and the constituent parts form one fishing and seaport town. Pop. (1931), 3325.

**ANT.** The common name of hymenopterous (or membranous-winged) insects of various genera, of the family Formicidæ, of which there are numerous species, at least 2000 being known. They are found in most temperate and tropical regions. They are small but powerful insects, and have long been noted for their remarkable intelligence and interesting habits. They are social insects, living in communities regulated by definite laws, each member of the society bearing a well-defined and separate part in the work of the colony.




The Wood-ant (*Formica rufa*)

1 Egg. 2 Larva. 3 Cocoon of fine white silk. 4 Young ant, taken out of cocoon. 5 Male ant. 6 Female ant. 7 Worker ant. (All magnified)

**Males and Females.** Each community consists of males ; of females much larger than the males ; and of barren females, otherwise called neuters, workers, or nurses. The neuters are wingless, and the males and females only acquire wings for their "nuptial flight," after which the males perish, and the few females which escape the pursuit of their numerous enemies divest themselves of their wings, and either return to established nests, or become the foundresses of new colonies.

The neuters perform all the labours of the ant-hill or abode of the community ; they excavate the galleries, procure food, and feed the larvæ or young ants, which have not got organs of motion. In fine weather they carefully convey them to the surface for the benefit of the sun's heat, and as attentively carry them to a place of safety either when bad weather is threatened or the ant-hill is disturbed. In like manner they watch over the safety of the nymphs or pupæ about to acquire their perfect growth. Some communities possess a special type of neuters, known as "soldiers," from the duties that specially fall upon them, and from their powerful biting jaws.

**Ant-hills.** There is a very considerable variety in the materials, size, and form of ant-hills, or nests, according to the peculiar nature or instinct of the species. Most of the British ants form nests in woods, fields, or gardens, their abodes being generally in the form of small mounds rising above the surface of the ground and containing numerous galleries and apartments. Some excavate nests in old tree-trunks. One little yellow ant (*Myrmica domestica*) is common in houses in Britain in some localities. Some ants live on animal food, very quickly picking quite clean the skeleton of any dead animal they may light on. Others live on saccharine matter, being very fond of the sweet substance called honey-dew which exudes from the bodies of aphides, or plant-lice. These they sometimes keep in their nests, and sometimes tend on the plants where they feed ; sometimes they even superintend their breeding. By stroking the aphides with their antennæ they cause them to emit the sweet fluid, which the ants then greedily sip up. Various other insects are looked after by ants in a similar manner, or are found in their nests. It has been observed that some species, like the European Red Ant (*Formica sanguinea*), resort to violence to obtain working ants of other species for their own use, plundering the nests of suitable kinds of their larvæ and pupæ, which they carry off to their own nests to be carefully reared and kept as slaves.

In temperate countries male and female ants survive, at most, till autumn, or to the commencement of cool weather, though a very large proportion of them cease to exist long previous to that time. The neuters pass the winter in a state of torpor, and of course require no food. The only time when they require food is during the season of activity, when they have a vast number of young to feed. Some ants of Southern Europe feed on grain, and store it up in their nests for use when required. Some species have stings as weapons, others only their powerful mandibles, or an acrid and pungent fluid (formic acid) which they can emit. The name ant is also given to the neuropterous insects otherwise called Termites (q.v.).

BIBLIOGRAPHY : Lord Avebury (Sir John Lubbock), *Ants, Bees, and Wasps* ; H. W. Bates, *A Naturalist on the Amazons* ; *Cambridge Natural History*.

**ANTAC'ID.** An alkali, or any

remedy for acidity in the stomach. Dyspepsia and diarrhœa are the diseases in which antacids are chiefly employed. The principal antacids in use are magnesia, lime, and their carbonates, and the carbonates of potash and soda.

**ANTÆ'US.** The giant son of Poseidon (Neptune) and Gē (the Earth), who was invincible so long as he was in contact with the earth. Heracles (Hercules) grasped him in his arms and stifled him suspended in the air, thus preventing him from touching the earth.

**ANTAKIEH,** or **ANTAKIA.** *See* ANTIOCH.

**ANTAL'KALI.** A substance which neutralizes an alkali, and is used medicinally to counteract an alkaline tendency in the system. All true acids have this power.

**ANTANANARIVO** (an-tan-an-a-rē'vō). The capital of Madagascar, situated in the central province of Imérina, on rocky eminences rising from a plain. Until 1869 all buildings within the city were of wood or rush, but since the introduction of brick and stone, the whole city has been rebuilt. It contains two former royal palaces, immense timber structures; a Protestant and a Roman Catholic cathedral, mission churches, schools, etc. Antananarivo is the residence of the French governor of Madagascar, and there is a strong French garrison. It has manufactures of metal work, cutlery, silk, etc. Pop. (exclusive of the troops) 58,459.

**AN'TAR.** An Arabian warrior and poet of the sixth century, author of one of the seven Moallakas (poems) hung up in the Kaaba at Mecca; hero of a romance analogous in Arabic literature to the Arthurian legend of the English. The romance of *Antar* is composed in rhythmic prose interspersed with fragments of verse, many of which are attributed to Antar himself, and has been generally ascribed to Asmai (born A.D. 740, died about A.D. 830), preceptor to Harun-al-Rashid. It has been published in 32 vols. at Cairo (1889).

**ANTARCTIC** (ant-ärk'tik). A term signifying the opposite of *Arctic*, and therefore relating to the southern pole or to the regions near it.

**Antarctic Circle.** The *Antractic Circle*, which of course corresponds to the *Arctic Circle*, is a circle parallel to the equator and distant from the south pole 23° 28′, marking the area within which the sun does not set when on the tropic of Capricorn. The Antarctic Circle has been arbitrarily fixed on as the limits of the Antarctic Ocean, it being the average limit of the pack-ice; but the name is often extended to embrace a much wider area. The lands within or near the Antarctic Circle are but imperfectly known, and a very large area around the south pole is altogether unknown.

**Exploration.** The work of exploration has been hitherto baffled at various points by what seems an unsurmountable ice-barrier, which in some places is connected with masses of land and may as a whole belong to a great Antarctic continent. Among land-masses that have long been know. to exist in the Antarctic Ocean, though our knowledge of them is very imperfect, are those to which have been attached the names Graham Land, Victoria Land, Wilkes Land, Enderby Land, South Shetland Islands, etc. The Antarctic regions are even colder and more inhospitable than the Arctic, and partly on account of their remoteness from the maritime nations there have been far fewer efforts at their exploration, the south pole being far less a goal of discovery than the north. *See* SOUTH POLAR EXPEDITIONS.

**ANT-EATER.** A name given to mammals of various genera that prey chiefly on ants, but usually confined to the genus Myrmecophăga, ord. Edentata. In this genus the head is remarkably elongated, the jaws destitute of teeth, and the mouth furnished with a long, extensile tongue covered with glutinous saliva, by the aid of which the animals secure their insect prey. The eyes are particularly small, the ears short and round, and the legs, especially the fore-legs, very strong, and furnished with long, compressed, acute nails, admirably adapted for breaking into the ant-hills.

Ant-eater

The most remarkable species is the *Myrmecophăga jubăta*, or ant-bear, a native of the warmer parts of South America. It is from 4 to 5 feet in length from the tip of the muzzle to the root of the black bushy tail, which is about 2 feet long. The body

is covered with long hair, particularly along the neck and back. It is a harmless and solitary animal, and spends most of its time in sleep. Some are adapted for climbing trees in quest of the insects on which they feed, having prehensile tails. All are natives of South America. The name ant-eater is also given to the pangolins and to the aardvark. The echidna of Australia is sometimes called *porcupine ant-eater*.

**ANTECE'DENT.** In grammar, the noun to which a relative or other pronoun refers; as, Solomon was the *prince who* built the temple, where the word *prince* is the antecedent of *who*. —In logic, that member of a hypothetical or conditional proposition which contains the condition, and which is introduced by *if* or some equivalent word or words; as, if the sun is fixed, the earth must move. Here the first and conditional proposition is the *antecedent*, the second the *consequent*.

**ANTEDILU'VIAN.** Before the flood or deluge of Noah's time; relating to what happened before the deluge. In geology the term has been applied to organisms, traces of which are found in a fossil state in formations preceding the Diluvial (Glacial epoch), particularly to extinct animals such as the palæotherium, the mastodon, etc.

**AN'TELOPE.** The name given to the members of a large family of Ruminant Ungulata or Hoofed Mammalia, closely resembling the Deer in general appearance, but essentially different in nature from the latter animals. They are included with the Sheep and Oxen in the family of the Cavicornia or "Hollow-horned" Ruminants. Their horns, unlike those of the Deer, are not deciduous, but are permanent; are never branched, but are often twisted spirally, and may be borne by both sexes. They are found in greatest number and variety in Africa. Well-known species are the chamois (European), the gazelle, the addax, the eland, the koodoo, the gnu, the springbok, the sasin or Indian antelope, and the prongbuck of America.

**ANTEN'NÆ.** The name given to the movable jointed organs of touch and hearing attached to the heads of insects, myriapods, etc., and commonly called horns or feelers. They present a very great variety of forms.

**ANTEQUERA** (ân-te-kā'rà). A city of Andalusia, in Spain, in the province of Malaga, a place of some importance under the Romans, with a ruined Moorish castle. It manufactures woollens, leather, soap, etc. Pop. 32,360.

**ANT'EROS.** In Greek mythology, the god of mutual love. According to some, however, Anteros is the enemy of love, or the god of antipathy; he was also said to punish those who did not return the love of others.

**ANTHE'LION,** pl. **ANTHELIA.** A luminous ring, or rings, seen by an observer, especially in alpine and polar regions, around the shadow of his head projected on a cloud or fog-bank, or on grass covered with dew, 50 or 60 yards distant, and opposite the sun when rising or setting. It is due to the diffraction of light.

**ANTHELMIN'THICS,** or **ANTHELMIN'TICS.** A class of remedies used to destroy worms when lodged in the alimentary canal; classed as vermicides or vermifuges, according as the object is to kill the worms, or to expel them by purgation.

**AN'THEM.** Originally a hymn sung in alternate parts; in modern usage, a sacred tune or piece of music set to words taken from the Psalms or other parts of the Scriptures, first introduced into church service in Elizabeth's reign; a developed motet. The anthem may be for one, two, or any number of voices, but seldom exceeds five parts, and may or may not have an organ accompaniment written for it.

**ANTHE'MION.** An ornament or ornamental series used in Greek and Roman decoration, which is derived from floral forms, more especially the

Anthemion, or floral ornamentation

honeysuckle. It was much used for the ornamentation of friezes and interiors, for the decoration of fictile vases, the borders of dresses, etc.

**AN'THEMIS.** A genus of composite plants, comprising the camomile or chamomile.

**ANTHE'MIUS.** A Greek mathematician and architect of Lydia; designed the church of St. Sophia at Constantinople, and is credited with the invention of the dome; died A.D. 534.

**AN'THER.** The male organ of the flower; that part of the stamen which is filled with pollen.

**ANTHESTE'RIA.** An annual Greek festival held in honour of all the gods, but especially in honour of Dionysus. It celebrated the beginning of spring, and the season when the wine of the previous vintage was considered fit for use.

**ANTHOCY'ANIN.** The blue colour of flowers, a pigment obtained from those petals of flowers which are blue, by digesting them in spirits of wine.

**ANTHOL'OGY** (Gr. *anthos*, a flower, and *legein*, to gather). The name given to several collections of short poems which have come down from antiquity. The first to compile a Greek anthology was Meleager, a Syrian, about 60 B.C. He entitled his collection, which contained selections from forty-six poets besides many pieces of his own, the *Garland*; a continuation of this work by Philip of Thessalonica in the age of Tiberius was the first entitled *Anthology*. Later collections are that of Constantine Cephalas, in the tenth century, who made much use of the earlier ones, and that of Maximus Planudes, in the fourteenth century, a monk of Constantinople, whose anthology is a tasteless series of extracts from the *Anthology* of Cephalas, with some additions. The treasures contained in both, increased with fragments of the older poets, idylls of the bucolic poets, the hymns of Callimachus, epigrams from monuments and other works, have been published in modern times as the *Greek Anthology*. There is no ancient Latin anthology, the oldest being that of Scaliger (1573).

**AN'THON, Charles, LL.D.** An American editor of classical schoolbooks, and of works intended to facilitate the study of Greek and Latin literature; born 1797, died 1867. He was long a professor in Columbia College, New York.

**AN'THONY, St.** The founder of monastic institutions, born near Heraclea, in Upper Egypt, A.D. 251. Giving up all his property he retired to the desert, where he was followed by a number of disciples, who thus formed the first community of monks. He died at the age of 105.

**St. Anthony's Fire.** A name given to erysipelas.

**AN'THRACENE** ($C_{14}H_{10}$). Occurs in coal-tar in small quantity, about 0.25-0.45 per cent. During the distillation of tar a high-boiling fraction, boiling above 270° C., is obtained; this is crude anthracene oil, a greenish oily substance which, on further distillation, yields a crystalline mass, 50 per cent anthracene. This is carefully purified by distillation and chemical treatment to separate the anthracene from the other substances occurring with it, and the product obtained is finally purified by crystallization. When pure it forms colourless crystalline scales melting at 216° C., and having a violet fluorescence.

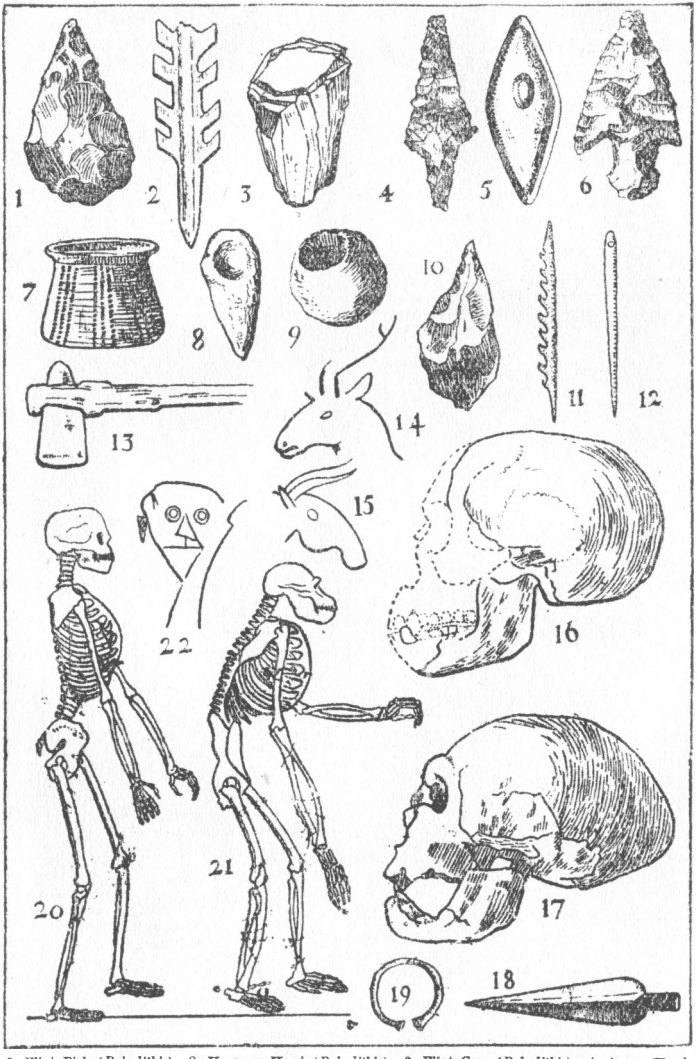
It forms a series of derivatives, the most important being anthraquinone and alizarine and the numerous derivatives of these. Anthracene was originally a useless product in coal-tar distillation, but it became valuable as soon as it was discovered that alizarine—from which many dyes are manufactured directly or indirectly—could be prepared from it.

**AN'THRACITE.** Glance or blind coal, a non-bituminous coal of a shining lustre, approaching to metallic, and which burns without smoke, with a weak or no flame, and with intense heat. It consists of, on an average, 90 per cent carbon, 2 oxygen, 3 hydrogen, and 5 ashes. It has some of the properties of coal or charcoal, and, like that substance, represents an extreme alteration of vegetable substances by loss of gases, either during conditions of decay or after entombment among stratified rocks. It is found in England, Scotland, and Ireland, and in large quantities in the United States (Pennsylvania), and near Swansea (South Wales). *See* COAL.

**AN'THRAX.** A fatal disease to which animals are subject, always associated with the presence of an extremely minute micro-organism (*Bacillus anthracis*) in the blood. It attacks cattle more frequently than other animals; sheep, horses, pigs, dogs, and fowls are liable to anthrax, but not cats. The mode of infection in animals is chiefly by ingestion. It may also be contracted through a wound or scratch in the skin, but this mode of infection is commoner in human beings than in animals. It frequently assumes an epizootic form, and extends over large districts, affecting all classes of animals which are exposed to the exciting causes. It is also called splenic fever, and is communicable to man, appearing as carbuncle, malignant pustule, or wool-sorter's disease.

**ANTHROPOL'ATRY.** The worship of man, a word always employed in reproach; applied by the Apollinarians, who denied Christ's perfect humanity, towards the orthodox Christians.

**ANTHRO'POLITE.** A petrifaction of the human body or skeleton, or of parts of the body, by the encrusting action of calcareous waters, and hence hardly to be considered fossil or subfossil.




1, Flint Pick (*Paleolithic*). 2, Harpoon Head (*Paleolithic*). 3, Flint Core (*Paleolithic*). 4, Arrow Head (*Neolithic*). 5, Perforated Axe (*Neolithic*). 6, Arrow Head (*Neolithic*). 7, Pot (*Neolithic*). 8, Pottery Spoon (*Neolithic*). 9, Grinding Stone (*Neolithic*). 10, Borer (*Paleolithic*). 11, Harpoon Head (*Paleolithic*). 12, Bone-Needle (*Paleolithic*). 13, Heavy Axe (*Neolithic*). 14, Head of Deer (*Aurignacian, which is a division of Paleolithic* (*engraved*) ). 15, Kind of Ox (*Aurignacian, which is a division of Paleolithic* (*engraved*) ). 16, Pilt-down Skull. 17, Neanderthal Skull. 18, Bronze Age Blade. 19, Gold Bracelet (*Celtic* (*early*) ). 20, Skeleton of Man (*Comparison*). 21, Skeleton of Chimpanzee (*Comparison*). 22, Sketch of Human Face from Cave (*Paleolithic*).

**ANTHROPOL'OGY.** The science of man, including the study of man's place in nature, that is, of the measurement of his agreement with and divergence from other animals and the history of the emergence of human characteristics; of the distinctive features and geographical distribution of the races of mankind, their customs and beliefs; of the remains of extinct types of the human family and the evidence relating to their modes of life. It puts under contribution all sciences which have man for their object, as anatomy, palæontology, psychology, archæology, history, and comparative religion.

All the races of mankind that are now living, much as they differ in external appearance, such as colour of skin, character of hair, form of skull, face, and body, and stature, belong to one species, *Homo Sapiens*; but an earlier species of more brutal type, *H. neanderthalensis*, now completely extinct, is known from fossil remains found in Germany, Belgium, France, Gibraltar, and Croatia. Three more ancient and primitive types, probably representing distinct genera of the human family, have been discovered respectively at Piltdown, in Sussex (Eoanthropus), at Mauer, near Heidelberg (Palæanthropus), and in Java, the Ape-man (Pithecanthropus). The Piltdown man may represent the very remote, but direct, ancestor of modern man; but the Heidelberg man and the Ape-man were probably divergent "sports" whose descendants never became men of the modern type.

**Gorilla and Aboriginal Australian.** In structure the gorilla reveals a close kinship with the human family, and was probably derived from a common ancestry which probably differentiated into man's forerunner and the gorilla's in Miocene times. Of existing races the aboriginal Australian is much the most primitive, and represents the survivial of the earliest type of *Homo Sapiens* soon after this species became differentiated from men of the Neanderthal species.

**Negro.** The negro, whose home is tropical Africa, is primitive in some respects, but in others is highly specialized. He is distinguished by his black skin, flat nose, prominent jaws and thick everted lips, and so-called "woolly" or "peppercorn" hair. In stature he shows a wider range of variation than any other race, including, as he does, the tallest and the shortest varieties of mankind.

**Bushman and Mongolian.** The Bushman is a peculiarly distinct racial type now restricted to the deserts of South Africa. Though his skin is yellowish rather than black, he is akin to the negro. The Mongolian race probably assumed its distinctive features, yellowish skin, coarse black hair, and characteristic facial and bodily traits, in Eastern Asia; and the Aboriginal population of America was sprung mainly from the less-specialized branch of this race.

**White Races.** The so-called white races include three main stocks, a people of short stature, olive complexion, and long heads, the Mediterranean race; a taller people with fair hair and long heads, the Nordic race; and a short, thick-set, black-haired, broad-headed Alpine race, which made its way from Asia into Europe many centuries after the other two chief components of Europe's population. For long ages in every part of the world intermixture has been taking place in varying degrees between the different races of mankind, so that to-day probably no pure race exists. *See* ETHNOGRAPHY, ETHNOLOGY. MAN, etc.—BIBLIOGRAPHY: E. B. Tylor, *Anthropology*; D. G. Brinton, *Races and Peoples*; W. Z. Ripley, *The Races of Europe*; E. Carpenter, *Anthropology*; G. Elliott Smith, *The Migrations of Early Culture*; H. G. F. Spurrell, *Modern Man and his Forerunners*; *Dictionnaire des Sciences Anthropologiques*; *The Journal of the Anthropological Institute of Great Britain*.

**ANTHROPOM'ETRY.** The systematic examination of the height, weight, and other physical characteristics of the human body. It was shown in the British Association Report of 1883 that variations in stature, weight, and complexion, existing in different districts of the British islands, are chiefly due to difference of racial origin.

The Scotch male adults stand first in height (68.71 inches), the Irish second (67.90 inches), the English third (67.66 inches), and the Welsh last (66.66 inches). In weight the Scotch take the first place (165.3 lb.), the Welsh take the second (158.3 lb.), the English the third (155.0 lb.), and the Irish the last (154.1 lb.).

The average height of adult females is 4.71 inches less than the male average, and their average weight 32.2 lb. under that of the males.

The average height of the adult males of the principal races or nationalities of the world may be given as under; but it is acknowledged that more numerous measurements might alter some of the figures considerably: Polynesians 69.33 inches, Patagonians 69 inches, Negroes of the Congo 69 inches, Scotch 68.71 inches, Iroquois Indians 68.28 inches,

Irish 67.90 inches, United States (whites) 67.67 inches, English 67.66 inches, Norwegians 67.66 inches, Zulus 66.19 inches, Welsh 66.66, inches, Danes 66.65 inches, Dutch 66.62 inches, American Negroes 66.62 inches, Hungarians 66.58 inches, Germans 66.54 inches, Swiss 66.43 inches, Belgians 66.38 inches, French 66.23 inches, Berbers 66.10 inches, Arabs 66.08 inches, Russians 66.04 inches, Italians 66 inches, Spaniards 65.66 inches, Esquimaux 65.10 inches, Papuans 64.78 inches, Hindus 64.76 inches, Chinese 64.17 inches, Poles 63.87 inches, Finns 63.60 inches, Japanese 63.11 inches, Peruvians 63 inches, Malays 62.34 inches, Lapps 59.2 inches, Bosjesmans 52.78 inches. General average, 65.25 inches.

**ANTHROPOMOR'PHISM.** The representation or conception of the Deity under a human form, or with human attributes and affections. *Anthropomorphism* is based upon the natural inaptitude of the human mind for conceiving spiritual things except through sensuous images, and in its consequent tendency to accept such expressions as those of Scripture when it speaks of the eye, the ear, and the hand of God, of His seeing and hearing, of His remembering and forgetting, of His making man in His own image, etc., in a too literal sense.

In a general sense anthropomorphism is the assumption of man that his own characteristics are present in beings or things widely different from himself, more particularly in forces of nature and gods. The term is, therefore, also applied to that doctrine which attributes to animals mental faculties of the same nature as those of man, though much lower in degree: strictly called *biological anthropomorphism*, to distinguish it from anthropomorphism proper, or *theological anthropomorphism*. Cf. E. Caird, *Evolution of Religion*; J. R. Illingworth, *Personality, Human and Divine*.

**ANTHROPOPH'AGI.** Man-eaters, cannibals. Cannibalism was practised in very ancient times; and though some peoples, as the New Zealanders and Fijians, have given it up in recent times, it is still practised over a wide area in Central Africa, where human flesh is a common article of food. Superstitious ideas are often associated with cannibalism among those who practise it. The Caribs were cannibals at the time of the Spanish conquest, and the word "cannibal" is derived from their name. *See* CANNIBALISM.

**ANTHUS.** *See* PIPIT.

**ANTI-AIRCRAFT GUNS.** Are guns so mounted that they may be pointed upward to fire directly against objects in the air. During the European War these guns, fitted with special appliances and ammunition, were used for defence against air-raids of the enemy, against Zeppelins and Gothas. The anti-aircraft guns are of various types, ranging from light machine-guns up to batteries of 3-inch and 6-inch guns. Some of them have brought down enemy machines flying at a height of 10,000 or 12,000 feet.

**ANTIBES** (ân-tēb) (ancient **ANTIPOLIS**). A fortified town and seaport of France, department Alpes-Maritimes, on the Mediterranean, 11 miles S.S.W. of Nice; founded about 340 B.C. Pop. 12,198.

**ANTI-BURGHER SYNOD.** A section of the Scottish Secession Church, which held its first meeting in Edinburgh in the house of Adam Gib on 10th April, 1747. It was formed in consequence of a breach resulting from a controversy respecting the religious clause of the oath taken by burgesses in Edinburgh, Glasgow, and Perth. Those in favour of the oath were designated Burghers, whilst their opponents, who condemned the oath of the burgesses, became known as Anti-Burghers. The union of the burgher and anti-burgher sections was brought about in 1820 through the exertions of John Jamieson, minister at the Anti-burgher Church in Nicholson Street, Edinburgh. *See* UNITED FREE CHURCH OF SCOTLAND.

**ANTICHLOR.** The name given to any chemical substance, such as hyposulphite of sodium, employed to remove the small quantity of chlorine which obstinately adheres to the fibres of the cloth when goods are bleached by means of chlorine.

**ANTICHRIST.** A word occurring in the first and second Epistles of St. John, and nowhere else in Scripture, in passages having an evident reference to a personage real or symbolical mentioned or alluded to in various other passages both of the Old and New Testaments. The *idea itself*, however, of Antichrist can be traced back to the second century, B.C., and appears first of all in the Book of Daniel.

In every age the Church has held through all its sects some definite expectation of a formidable adversary of truth and righteousness prefigured under this name. Thus Roman Catholics have found Antichrist in heresy, and Protestants in Romanism. In one point the sects have generally been agreed, namely, in regarding the various intimations on this subject in the Old and New Testaments as a

homogeneous declaration or warning, inspired by the spirit of prophecy, of danger to the true religion from some disaffection and revolt organized in the latter days by Satan. Most modern critics take a different view of the matter. They do not regard the various Scriptural writers who have dealt with this subject as having had any common inspiration or design. They believe that each writer from his own point of view, guided by mere human sagacity, gives expression in his predictions to his own individual apprehensions, or narrates as prediction what he already knows.

Originally Antichrist is nothing else than the incarnate devil, and the idea of the battle of God with a human opponent, endowed with devilish wickedness, arose under the influence of historical conditions. It is the near political horizon which suggests the danger, or contemporary history the substance of the prophecy; thus the Antichrist of Daniel is Antiochus Epiphanes, that of St. John Nero, that of St. Paul some adversary of Christianity about to appear in the time of the Emperor Claudius.—BIBLIOGRAPHY: S. Baring-Gould, *Curious Myths of the Middle Ages*; W. Bousset, *Antichrist*.

**ANTICLI'MAX.** A sudden declension of a writer or speaker from lofty to mean thoughts or language, as in the well-known lines, quoted in Pope's *Martinus Scriblerus on the Art of Sinking in Poetry* as from an anonymous author:

> And thou, Dalhousie, the great god of war,
> Lieutenant-colonel to the Earl of Mar.

Pope, Addison, and Fielding were masters in this art of sudden descent.

**ANTICLI'NAL LINE OR AXIS.** In geology, the ridge of a wave-like curve made by a series of superimposed strata, the strata dipping from it on either side as from the ridge of a house: a *synclinal line* runs along the trough of such a wave.

**ANTI-CORN-LAW LEAGUE.** An association formed in England in 1836 to procure the repeal of the laws regulating or forbidding the importation of corn. The object of the league was attained in 1846.

**ANTICOS'TI.** An island of Canada, in the mouth of the St. Lawrence, 125 miles long by 30 miles broad. The interior is mountainous and wooded, but there is much good land, and it is well adapted for agriculture.

**ANTICY'CLONE.** A phenomenon presenting some features opposite to those of a cyclone. It consists of a region of high barometric pressure, the pressure being greatest in the centre, with light winds flowing outwards from the centre, and not inwards as in the cyclone, accompanied with great cold in winter and with great heat in summer.

**ANTICYRA** (an-tis'i-ra). The name of two towns of Greece, the one in Thessaly, the other in Phocis, famous for hellebore, which in ancient times was regarded as a specific against insanity and melancholy. Hence various jocular allusions in ancient writers (*Naviga Anticyram*, sail to Anticyra).

**AN'TIDOTE.** A medicine to counteract the effects of poison.

**ANTIETAM** (an-tē'tam). A small stream in the United States which falls into the Potomac about 50 miles N.W. of Washington; scene of an indecisive battle between the Federal and Confederate armies, 17th Sept., 1862.

**ANTI-FEDERALISTS.** The political party in the United States which after the formation of the Federal constitution in 1787 opposed its ratification. Whilst the Federalists were striving to turn the federation into a united nation, and stood for a strong Government and centralizing tendencies, their opponents, the Anti-Federalists, either more democratic, or pretending that a strong Government meant a "disguised" monarchic power, endeavoured to preserve a loose disintegrated federation. The Anti-Federalist party was gradually transformed into the Democratic-Republican party, led by Jefferson.

**ANTIFRICTION METAL.** A name given to various alloys of tin, zinc, copper, antimony, lead, etc., which oppose little resistance to motion, with great resistance to the effect of friction, so far as concerns the wearing away of the surfaces of contact. Babbitt's metal (50 parts tin, 5 antimony, 1 copper) is one of them.

**ANTIGONE** (an-tig'o-nē). In Greek mythology, the daughter of Œdipus and Jocasta, celebrated for her devotion to her brother Polynices, for burying whom against the decree of King Creon she suffered death. She is the heroine of Sophocles *Œdipus at Colonus* and his *Antigone*; also of Racine's tragedy *Les Frères Ennemis*.

**ANTIG'ONISH.** A town in the E. of Nova Scotia, in county of the same name; the seat of a Roman Catholic bishop, with a cathedral, a college, and a good harbour. Pop. 1787.

**ANTIG'ONUS.** One of the generals of Alexander the Great, born about 382 B.C. In the division of the empire, after the death of Alexander,

Antigonus obtained Greater Phrygia, Lycia, and Pamphylia as his dominion. But he soon managed to extend his power, being assisted by his warlike son, Demetrius Poliorcētēs. Ptolemy, Seleucus, and Lysimachus, who had also been generals of Alexander, alarmed by his ambition, united themselves against him; and a long series of contests ensued in Syria, Phœnicia, Asia Minor, and Greece, ending in 301 B.C. with the battle of Ipsus in Phrygia, in which Antigonus was defeated and slain, his dominions being divided among the conquerors.

**ANTIGONUS GON'ATAS.** Son of Demetrius Poliorcētēs, and grandson of the above, succeeded his father in the kingdom of Macedon and all his other European dominions, but did not obtain actual possession of them for some years. He died, after a reign of forty-four years, 239 B.C.

**ANTIGUA** (an-tē'gwa). One of the British West Indies, the most important of the Leeward group; 28 miles long, 20 broad; area, 108 sq. miles. Its shores are high and rocky, and much indented by creeks and inlets furnishing several good harbours. The surface is diversified by hill and dale, but nowhere rises to a greater height than 1500 feet. A considerable portion of it is fertile, and the climate is healthy, but there is a scarcity of water, there being no streams and few springs, droughts are not infrequent, and hurricanes are apt to cause serious loss and damage. Chief products are sugar, cotton, and pineapples. The island has fairly good shipping connections with the United Kingdom, the United States and Canada.

Antigua is governed as a crown colony, the Islands of Barbuda and Redonda being attached to it. The capital, St. John, the residence of the governor of the Leeward Islands, stands on the shore of a well-sheltered harbour in the north-west part of the island. Falmouth (English Harbour) in the south has also an excellent harbour with a dockyard. The island was discovered by Columbus in 1493; the first settlement was made by the English in 1632. Since then, except for a short period of occupation by the French, it has been a British possession. Pop. 29,767.

**ANTI-JAC'OBIN.** A famous magazine (1797-1818), the original object of which was to satirize the Jacobin principles of the Fox section of Whigs; principal contributors: Gifford, Canning, Frere, and Ellis.

**ANTI'LEBANON.** The eastern of the two parallel ranges known as the Mountains of Lebanon in Palestine. *See* LEBANON.

**ANTILEGOM'ENA** (things spoken against or objected to). A term applied by early Christian writers to the Epistle to the Hebrews, 2 Peter, James, Jude, 2 and 3 John, and the Apocalypse, which, though read in the churches, were not for some time received into the canon of Scripture.

**ANTILLES** (an-til'ēz). Another name for the West Indian Islands (excluding Bahamas). *See* WEST INDIES.

**ANTILOCHUS** (an-til'o-kus). In Greek legend, a son of Nestor, distinguished among the younger heroes who took part in the Trojan War by beauty, bravery, and swiftness of foot. He was slain by Memnon, but Achilles avenged his death.

**ANTIMACASS'AR.** A covering for chairs, sofas, couches, etc., made of open cotton or worsted work, to preserve them from being soiled, as by the oil applied to the hair.

**ANTIMACHUS** (an-tim'a-kus). A Greek poet who lived about 400 B.C., and wrote an epic called the *Thebais* on the mythical history of Thebes, and a long elegy called *Lydē*, inspired by a mistress or wife of that name. Both works were full of mythological details. Only fragments of his writings remain, and from these it can be gathered that his style was rather laboured and artificial. Yet the Alexandrian grammarians ranked him next to Homer.

**AN'TIMONY** (chemical symbol, Sb, from Lat. *stibium*; sp. gr. 6.7, atomic wt. 120.2). A brittle metal of a bluish-white or silver-white colour and a crystalline or laminated structure. It melts at 630.6° C., and burns with a bluish-white flame. The mineral called stibnite or antimony-glance, is a tri-sulphide ($Sb_2S_3$), and is the chief ore from which the metal is obtained. It is found in many places, including France, Spain, Hungary, Italy, Canada, Australia, and Borneo.

The metal, or, as it was formerly called, the regulus of **antimony**, does not rust or tarnish when exposed to the air. When alloyed with other metals it hardens them, and is therefore used in the manufacture of alloys, such as Britannia-metal, type-metal, and pewter. In bells it renders the sound more clear; it renders tin more white and sonorous as well as harder, and gives to printing types more firmness and smoothness. The salts of antimony are very poisonous. The protoxide is the active base of tartar emetic and James's powder.

and is justly regarded as a most valuable remedy in many diseases. **Yellow antimony** is a preparation of antimony of a deep yellow colour, used in enamel and porcelain painting. It is of various tints, and the brilliancy of the brighter hues is not affected by foul air.

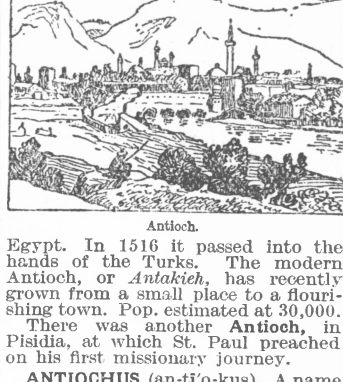
**ANTINO'MIANISM**(" opposition to the law "). The name given by Luther to the inference drawn by John Agricola (1492-1566), from the doctrine of justification by faith, that the moral law is not binding on Christians as a rule of life. The term antinomian has since been applied to all doctrines and practices which seem to contemn or discountenance strict moral obligations. The Lutherans and Calvinists have both been charged with antinomianism, the former on account of their doctrine of justification by faith, the latter both on this ground and that of the doctrine of predestination. The charge is, of course, vigorously repelled by both.

**ANTIN'OMY.** The opposition of one law or rule to another law or rule ; in the Kantian philosophy, that natural contradiction which results from the law of reason, when, passing the limits of experience, we seek to conceive the complex of external phenomena, or nature, as a world or cosmos.

**ANTINOUS** (an-tin'o-us). A young Bithynian whom the extravagant love of Hadrian has immortalized. He drowned himself in the Nile in A.D. 122. Hadrian set no bounds to his grief for his loss. He gave his name to a newly-discovered star, erected temples in his honour, called a city after him, and caused him to be adored as a god throughout the empire. Statues, busts, etc., of him are numerous.

**ANTIOCH** (an'ti-ok). A town in Syria, famous in ancient times as the capital of the Greek Kings of Syria, on the left bank of the Orontes, about 21 miles from the sea, in a beautiful and fertile plain. It was founded by Seleucus Nicator in 300 B.C., and named after his father Antiochus. In Roman times it was the seat of the Syrian governors, and the centre of a widely-extended commerce. It was called the " Queen of the East " and " The Beautiful."

Antioch is frequently mentioned in the New Testament, and it was here that the disciples of our Saviour were first called Christians (Acts xi. 26). In the first half of the seventh century it was taken by the Saracens, and in 1098 by the Crusaders. They established the principality of Antioch, of which the first ruler was Bohemond, and which lasted till 1268, when it was taken by the Mameluke Sultan of



Antioch.

Egypt. In 1516 it passed into the hands of the Turks. The modern Antioch, or *Antakieh*, has recently grown from a small place to a flourishing town. Pop. estimated at 30,000.

There was another **Antioch,** in Pisidia, at which St. Paul preached on his first missionary journey.

**ANTIOCHUS** (an-ti'o-kus). A name of several Græco-Syrian kings of the dynasty of the Seleucidæ.

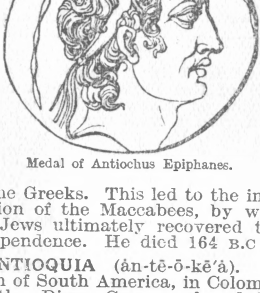
**Antiochus I.**, called *Sōtēr* (" saviour "), was the son of Seleucus, general of Alexander the Great, and founder of the dynasty. He was born about 324 B.C., and succeeded his father in 280 B.C. During the greater part of his reign he was engaged in a protracted struggle with the Gauls who had crossed from Europe, and by whom he was killed in battle, 261 B.C.

**Antiochus II.**, surnamed *Theos* (god), succeeded his father, lost several provinces by revolt, and was murdered in 246 B.C. by Laodicē, his wife, whom he had put away to marry Berenicē, daughter of Ptolemy.

**Antiochus III.**, surnamed the *Great*, grandson of the preceding, was born 242 B.C., succeeded in 223 B.C. The early part of his reign embraced a series of wars against revolted provinces and neighbouring kingdoms, his expeditions extending to India, over Asia Minor, and afterwards into Europe, where he took possession of the Thracian Chersonese. Here he encountered the Romans, who had conquered Philip V. of Macedon, and were prepared to resist his further progress. Antiochus gained an important adviser in Hannibal, who had fled for refuge to his Court ; but he lost the opportunity of an invasion of Italy while the Romans were engaged in war with the Gauls, of which the Carthaginian urged him to avail himself. The Romans defeated him by sea and land, and he was finally overthrown by Scipio at Mount Sipylus,

in Asia Minor, 190 B.C., and very severe terms were imposed upon him. He was killed while plundering a temple in Elymais to procure money to pay the Romans.

Antiochus IV., called *Epiphanes*, youngest son of the above, is chiefly remarkable for his attempt to extirpate the Jewish religion, and to establish in its place the polytheism



Medal of Antiochus Epiphanes.

of the Greeks. This led to the insurrection of the Maccabees, by which the Jews ultimately recovered their independence. He died 164 B.C

**ANTIOQUIA** (án-tē-ō-kē'á). A town of South America, in Colombia, on the River Cauca; founded in 1542. Pop. 8730. It gives name to a department of the republic; area, 22,752 sq. miles. Pop. 823,226 Capital, Medellin.

**ANTIP'AROS** (ancient, **OLIÄROS**). One of the Cyclades Islands in the Grecian Archipelago, containing a famous stalactitic grotto or cave. It lies south-west of Paros, from which it is separated by a narrow strait, and has an area of 10 sq. miles, and about 700 inhabitants.

**ANTIP'ATER.** A general and friend of Philip of Macedon, father of Alexander the Great. On the death of Alexander, in 323 B.C., the regency of Macedonia was assigned to Antipater, who succeeded in establishing the Macedonian rule in Greece on a firm footing. He died, 317 B.C., at an advanced age

**ANTIP'ATHY.** A special dislike exhibited by individuals to particular objects or persons, usually resulting from physical or nervous organization. An antipathy is often an unaccountable repugnance to what people in general regard with no particular dislike, as certain sounds, smells, articles of food, etc., and it may be manifested by fainting or extreme discomfort.

**ANTIPHLOGIS'TIC.** A term applied to medicines or methods of treatment that are intended to counteract inflammation, such as bloodletting, purgatives, diaphoretics, etc.

**AN'TIPHON.** A Greek orator, born near Athens; founder of political oratory in Greece. His orations are the oldest extant, and he is said to have been the first who wrote speeches for hire. He was put to death for taking part in the revolution of 411 B.C., which established the oligarchic government of the Four Hundred. Antiphon seems to have specialized in homicide cases; his most celebrated speech is *On the Murder of Herodas*. Cf. Sir R. C. Jebb, *Attic Orators*; J. F. Dobson, *The Greek Orators*.

**ANTIPHON,** or **ANTIPH'ONY** ("alternate song"). In the Christian Church a verse first sung by a single voice, and then repeated by the whole choir; or any piece to be sung by alternate voices.

**ANTIPODES** (an-tip'o-dēz). The name given relatively to people or places on opposite sides of the earth, so situated that a line drawn from one to the other passes through the centre of the earth and forms a true diameter. The longitudes of two such places differ by 180°. The difference in their time is about twelve hours, and their seasons are reversed.

**ANTIPODES ISLANDS.** A group of small uninhabited islands in the South Pacific Ocean, about 460 miles S.E. by E. of New Zealand; so called from being nearly antipodal to Greenwich. Antipodes Island rises to 1300 feet, and is largely covered with coarse grass; huts have been fitted up to shelter castaways.

**AN'TIPOPE.** The name applied to those who at different periods have produced a schism in the Roman Catholic Church by opposing the authority of the Pope, under the pretence that they were themselves Popes. The Roman Church cannot admit that there ever existed two Popes; but the fact is, that in several cases the competitors for the papal chair were equally Popes; that is to say, the claims of all were equally good. Each was frequently supported by whole nations, and the schism was nothing but the struggle of political interests. Twenty-nine antipopes are enumerated in Church history; the last of them is Felix V., 1439-49.

**ANTIPYRET'ICS.** Medicines given for the purpose of reducing fever by lowering the patient's temperature, whether by causing perspiration or otherwise. Quinine, antipyrin, phenacetin, are common antipyretics. An aperient or purgative often serves the same purpose.

**ANTIPY'RIN.** A drug obtained from coal-tar products, valuable in reducing fever and in relieving pain, being much used in nervous headache and neuralgia.

**AN'TIQUARIES.** Those devoted to the study of ancient times through their relics, as old places of burial, remains of ancient habitations, early monuments, implements or weapons, statues, coins, medals, paintings, inscriptions, books, and manuscripts, with the view of arriving at a knowledge of the relations, modes of living, habits, and general condition of the people who created or employed them. Societies or associations of antiquaries have been formed in all countries of European civilization. In Britain the Society of Antiquaries of London was founded in 1572, revived in 1717, and incorporated in 1751. The Society of Antiquaries of Scotland was founded in 1780, incorporated in 1783, and has the management of a large national antiquarian museum in Edinburgh. One of the best-known antiquarian societies in Europe is the *Société Royale des Antiquaires du Nord* at Copenhagen.

**ANTIQUES** (an-tēks'). A term specifically applied to the remains of ancient art, as statues, paintings, vases, cameos, and the like, and more especially to the works of Grecian and Roman antiquity.

**ANTIRRHINUM** (an-ti-rī'num) (from *anti*, instead of, and *rhis*, snout). A genus of annual or perennial plants of the nat. ord. Scrophulariaceæ, commonly known as *snapdragon*, on account of the peculiarity of the blossoms, which, by pressing between the finger and thumb, may be made to open and shut like a mouth. They all produce showy flowers, and are much cultivated in gardens. Many varieties of some of them, such as the great or common snapdragon (*Antirrhinum majus*), have been produced by gardeners. The lesser snapdragon grows in sandy soil, and is found in cornfields in the south of England and Ireland.

**ANTISANA** (ân-tē-sä'nà). A volcano in the Andes of Ecuador, 35 miles S.E. by E. of Quito. Whymper, who ascended it in 1880, makes its height 19,260 feet.

**ANTIS'CIANS** (Gr. *anti*, over against, *skia*, a shadow). Those who live under the same meridian, at the same distance N. and S. of the equator, and whose shadows at noon consequently are thrown in contrary directions.

**ANTISCORBU'TICS.** Remedies against scurvy. Lemon-juice, ripe fruit, milk, salts of potash, green vegetables, potatoes, fresh meat, and raw or lightly-boiled eggs, are some of the principal food-stuffs containing antiscorbutic vitamines.

**ANTI-SEM'ITISM.** Hostility to the Jews (Semites), actively exhibited in severities and attacks of various kinds. The movement assumed vast proportions about 1880 and manifested itself in various countries, especially Russia, Austria-Hungary, Germany, Romania, and France. It may be attributed to different motives in different countries, but on the whole owed its origin not only to the fact of the Jews being a "peculiar people" by race and religion, but also to the comparatively high position won by them in modern times in the financial and political worlds. The religious element is quite prominent in the popular attacks on the Jew, although modern anti-Semitism is essentially social and economic.

In Western Russia there was a great outburst against the Jews in 1881, in which men, women, and children were slaughtered. The Government of the Tsar, by its anti-Jewish policy, may be said to have sanctioned this murderous outbreak, which was followed by harsh laws and actual persecutions, though afterwards there was a mitigation of the severity shown towards the Jews. Yet in 1903 the world was startled by a terrible massacre of Jews at Kishinev, in Bessarabia, connived at by the authorities on the spot; and towards the end of 1905, in connection with the Russian revolutionary movement, there were dreadful massacres of Jews in Odessa, Kishinev, and other towns, the authorities being similarly involved.

In Romania, until 1919, the position of the Jews resembled what it was elsewhere in mediæval times, and was less favourable than it was even under the Turks. In Germany the movement has been worked chiefly by politicians for their own ends, though the racial and religious question has also had some influence; and among the ignorant the belief that the Jews murder Christian children for ritual purposes has been revived, as also in Austria and in Hungary.

In these countries the movement has been partly political, partly social and economic, partly religious. In France anti-Semitism has been employed chiefly as a weapon by monarchists and clericals as against republicanism, and by the Socialists as against capitalism, racial antipathy having also its influence on the movements. It reached its height in 1895 at the time of the Dreyfus affair.

In Britain, too, anti-Semitism has of late made itself felt.

In 1933 an organised anti-Semite Campaign on a large scale was carried out in Germany under the leadership of Herr Adolf Hitler, the Chancellor.

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**ANTISEP'TIC** (Gr. *anti*, against, and *sēpein*, to rot). An agent which destroys the germs of putrefaction or suppuration is called an antiseptic. Many substances act thus, e.g. chlorine iodine, hypochlorous acid, sulphurous acid, camphor, creosote, iodoform, nascent oxygen ("Sanitas") corrosive sublimate, formaldehyde ("Formalin"), potassium permanganate ("Condy's Fluid"), carbolic acid (Lysol, Izal, Cyllin); lately aniline dyes have become prominent: of these flavine has proved the most useful addition to surgery of recent years. It was much used in the European War (1914-8).

Antiseptics are also used for purifying surgical instruments, etc., and commercially as disinfectants. When introduced by Lister into surgical practice they led to revolutionary advances in surgery. The tendency of late years has been to abandon antiseptic for aseptic (sterile) mode of technique, but during the war (1914-8) there was a general return to antiseptic methods in surgery.

**ANTISPASMOD'IC.** A medicine for the cure of spasms and convulsions; such belong largely to the class of ethers, as sulphuric ether, chloric ether, nitric ether, etc.

**ANTISTHENES** (an-tis'the-nēz). A Greek philosopher and the founder of the school of Cynics, born at Athens about 444 B.C. He was first a disciple of Gorgias and then of Socrates, at whose death he was present. His philosophy was a one-sided development of the Socratic teaching. He held virtue to consist in complete self-denial and in disregard of riches, honour, or pleasure of every kind. He himself lived as a beggar. He died in Athens at an advanced age.

**ANTIS'TROPHE.** *See* STROPHE.

**ANTI-SUBMARINE.** *See* SUBMARINE.

**ANTI-TAURUS.** A mountain range of Anatolia, Asia Minor, extending from the Cicilian Taurus towards the north-east, and connecting the Taurus mountain system with Mount Ararat, Mount Elbruz, and the Caucasus. *See* TAURUS.

**ANTITH'ESIS** (opposition). A figure of speech consisting in a contrast or opposition of words or sentiments: as, "When our vices *leave us*, we flatter ourselves we *leave them*;" "The prodigal *robs his heir*, the miser *robs himself*."

**ANTITOXIN.** The name given to a class of bodies of unknown nature having the capacity of neutralizing the poisonous substances (toxins) by which certain bacteria produce disease. If such a toxin be introduced every few days in increasing doses, into, e.g., the horse, and if, after some months of this treatment, the animal be bled, its serum contains the antitoxin to the toxins used. The use of the antitoxin to the toxin of diphtheria is most efficacious in curing that disease, and the treatment has caused a great fall in the death-rate. It ought to be applied as soon as possible after signs appear in the throat.

An antitoxic treatment is also applicable in cases of tetanus (lock-jaw), a disease liable to follow any wound contaminated with dirt, especially with manured soil. Less success has been achieved when the disease is fully established, but if the antitoxin be injected immediately after the wound has been incurred, then the subsequent development of the disease is prevented. This preventive treatment has been attended with marked effect in the case of wounds received in war, which it is almost impossible to keep free from contamination. Antitoxins were extensively used during the European War (1914-8).

In bacterial diseases other than those mentioned, sera have been produced by injecting into large animals dead and living bacteria, e.g. the organisms of epidemic cerebro-spinal meningitis (spotted fever), pneumonia, blood-poisoning, etc., and these sera probably depend for their action on the presence of bodies similar to antitoxins. *See* BACTERIA, DIPHTHERIA.

**ANTI-TRADE WINDS.** A name given to any of the upper tropical winds which move northward or southward in the same manner as the trade winds which blow beneath them in the opposite direction. These great aerial currents descend to the surface after they have passed the limits of the trade winds, and form the south-west or west-south-west winds of the north temperate, and the north-west or west-north-west winds of the south temperate zones.

**ANTITRINITA'RIANS.** All who do not receive the doctrine of the divine Trinity, or the existence of three persons in the Godhead; especially applied to those who oppose such a

doctrine on philosophical grounds, as contrasted with Unitarians, who reject the doctrine as not warranted by Scripture.

**ANTITYPE.** That which is correlative to a type; by theological writers the term is employed to denote the reality of which a *type* is the prophetic symbol.

**ANTIUM.** In ancient Italy, one of the most ancient and powerful cities of Latium, the chief city of the Volsci, and often at war with the Romans, by whom it was finally taken in 338 B.C. It was 38 miles distant from Rome, a flourishing seaport, and became a favourite residence of the wealthy Romans. It was destroyed by the Saracens, but vestiges of it remain at Porto d'Anzo, near which many valuable works of art have been found.

**ANTIVARI** (ân-tē'vȧ-rē) A seaport town on the eastern shore of the Adriatic, ceded to Montenegro by the Treaty of Berlin (1878). Antivari was opened as a free port on 23rd Oct., 1909. It was occupied by the Austrians in 1916, and by the Italians in Nov., 1918. Pop. 2500.

**ANTLERS.** The horns of the deer tribe, or the snags or branches of the horns.

Antlers

**ANT-LION.** The larva of a Neuropterous insect (*Myrmeléon formicárius*), which in its perfect state greatly resembles a dragon-fly; curious on account of its ingenious method of catching the insects—chiefly ants—on which it feeds. It digs a funnel-shaped hole in the driest and finest sand it can find, and when the pit is deep enough, and the sides are quite smooth and sloping, it buries itself at the bottom with only its formidable mandibles projecting, and waits till some luckless insect stumbles over the edge, when it is immediately seized, its juices sucked, and the dead body jerked out. It inhabits Southern Europe.

**ANTOFAGAS'TA.** A Chilian seaport on the Bay of Morena, and a territory of the same name taken from Bolivia in the war of 1879-82, and definitely ceded to Chile in 1885. The territory has an area of 46,408 sq. miles; pop. (1920), 172,330. The port is connected by railway with the silver and other mines lying inland, and exports silver, copper, cubic nitre, etc., partly from Bolivia. Pop. (1930), 53,591.

**ANTOINETTE** (ȧn-twȧ-net), **Marie.** *See* MARIE ANTOINETTE.

**ANTOKOLSKI, Mark.** Russian sculptor of Jewish extraction, born at Vilna in 1843. He studied at the Petrograd Academy of Fine Arts, and his earliest success was a wooden statue *The Jewish Tailor* (1864). In 1868 he received a grant for travelling, and whilst in Italy he finished his famous statue, *Ivan the Terrible*. He was made an academician, and in 1878 was awarded the first prize for sculpture at the Paris International Exhibition. In 1888 he settled permanently in Paris, where he died in 1902. His works include: *Peter the Great* (1872), *Christ before the People* (1874), *The Death of Socrates* (1876), *Spinoza* (1882), *Vermak* and *The Sleeping Beauty* (1900).

**ANTOMMARCHI** (-mär'kē), **Carlo Francesco.** Italian physician, born in Corsica in 1780, died in Cuba 1838. He was professor of anatomy at Florence when he offered himself as physician to Napoleon at St. Helena. Napoleon at first received him with reserve, but soon admitted him to his confidence, and testified his satisfaction with him by leaving him a legacy of 100,000 francs. On his return to Europe he published *Les Derniers Moments de Napoléon* (2 vols., 8vo, 1823).

**ANTONELLI, Giacomo, Cardinal.** Born 1806, died 1876. He was educated at the Grand Seminary of Rome, where he attracted the attention of Pope Gregory XVI., who appointed him to several important offices. On the accession of Pius IX. in 1846 Antonelli was raised to the dignity of

cardinal-deacon; two years later he became president and Minister of Foreign Affairs, and in 1850 was appointed Secretary of State. During the sitting of the Œcumenical Council (1869-70) he was a prominent champion of the papal interest. He strongly opposed the assumption of the united Italian crown by Victor Emanuel.

**ANTONELL'O** (of Messina). An Italian painter who died at Venice, probably in 1493, and is said to have introduced oil-painting into Italy, having been instructed in it by Jan Van Eyck. Three works by him are in the National Gallery, London.

**ANTONINES, Age of the.** Period of Roman history between the accession of Titus Antoninus (Pius) A.D. 138, and the death of his adopted son, Marcus Aurelius, A.D. 180. It was a period of great prosperity within the Roman Empire, both emperors being men of moderation and high ideals.

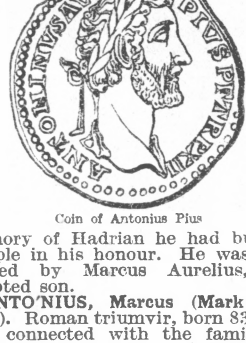
**ANTONI'NUS, Itinerary of.** *See* ITINERARY.

**ANTONI'NUS, Marcus Aurelius.** *See* AURELIUS.

**ANTONI'NUS, Wall of.** A barrier erected by the Romans across the isthmus between the Forth and the Clyde, in the reign of Antoninus Pius. Its western extremity was at or near Dunglass Castle, its eastern at Carriden, and the whole length of it exceeded 27 miles. It was constructed A.D. 140 by Lollius Urbicus, the imperial legate, and consisted of a ditch 40 feet wide and 20 feet deep, and a rampart of stone and earth on the south side 24 feet thick and 20 feet in height. It was strengthened at either end and along its course by a series of forts and watchtowers. It may still be traced at various points, and is commonly known as *Graham's Dyke*.

**ANTONI'NUS PIUS, Titus Aurelius Fulvus.** Roman emperor, was born at Lavinium, near Rome, A.D. 86, died A.D. 161. In 120 A.D. he became consul, and he was one of the four persons of the consular rank among whom Hadrian divided the supreme administration of Italy. He then went as proconsul to Asia, and after his return to Rome became more and more the object of Hadrian's confidence. In A.D. 138 he was selected by that emperor as his successor, and the same year he ascended the throne. He speedily put down the persecutions of the Christians, and carried on but a few wars.

In Britain he extended the Roman dominion, and, by raising a new wall (see preceding article), put a stop to the invasions of the Picts and Scots. The senate gave him the surname *Pius*, that is, dutiful or showing filial affection, because to keep alive the




Coin of Antonius Pius

memory of Hadrian he had built a temple in his honour. He was succeeded by Marcus Aurelius, his adopted son.

**ANTO'NIUS, Marcus (Mark Antony).** Roman triumvir, born 83 B.C., was connected with the family of Cæsar by his mother. Debauchery and prodigality marked his youth. To escape his creditors he went to Greece in 58, and from thence followed the consul Gabinius on a campaign in Syria as commander of the cavalry. He served in Gaul under Cæsar in 52 and 51. In 50 he returned to Rome to support the interests of Cæsar against the aristocratical party headed by Pompey, and was appointed tribune. When war broke out between Cæsar and Pompey, Antony led reinforcements to Cæsar in Greece, and in the battle of Pharsalia he commanded the left wing. He afterwards returned to Rome with the appointment of Master of the Horse and Governor of Italy (47).

In 44 B.C. he became Cæsar's colleague in the consulship. Soon after Cæsar was assassinated, Antony, by the reading of Cæsar's will, and by the oration which he delivered over his body, excited the people to anger and revenge, and the murderers were obliged to flee. After several quarrels and reconciliations with Octavianus, Cæsar's heir (*see* AUGUSTUS), Antony departed to Cisalpine Gaul, which province had been conferred upon him against the will of the Senate. But Cicero thundered against him in his famous *Philippics*; the Senate declared him a public enemy, and entrusted the conduct of the war against him to Octavianus and the consuls Hirtius and Pansa. After a campaign of varied fortunes Antony fled with his troops over the Alps. Here he was joined by Lepidus, who commanded in Gaul, and through whose mediation Antony and Octavianus were again reconciled. It

was agreed that the Roman world should be divided among the three conspirators, who were called *triumviri*. Antony was to take Gaul; Lepidus, Spain; and Octavianus, Africa and Sicily. They decided upon the proscription of their mutual enemies, each giving up his friends to the others, the most celebrated of the victims being Cicero the orator. Antony and Octavianus departed in 42 for Macedonia, where the united forces of their enemies, Brutus and Cassius, formed a powerful army, which was, however, speedily defeated at Philippi.

**Cleopatra.** Antony next visited Athens, and thence proceeded to Asia. In Cilicia he ordered Cleopatra, Queen of Egypt, to apologize for her insolent behaviour to the *triumviri*. She appeared in person, and her charms fettered him for ever. He followed her to Alexandria, where he bestowed not even a thought upon the affairs of the world, till he was aroused by a report that hostilities had commenced in Italy between his own relatives and Octavianus. A short war followed, which was decided in favour of Octavianus before the arrival of Antony in Italy. A reconciliation was effected, which was sealed by the marriage of Antony with Octavia, the sister of Octavianus. A new division of the Roman dominions was now made (in 40), by which Antony obtained the East, Octavianus the West.

After his return to Asia Antony gave himself up entirely to Cleopatra, assuming the style of an Eastern despot, and so alienating many of his adherents and embittering public opinion against him at Rome. At length war was declared at Rome against the Queen of Egypt, and Antony was deprived of his consulship and government. Each party assembled its forces, and Antony lost, in the naval battle at Actium, 31 B.C., the dominion of the world. He followed Cleopatra to Alexandria, and on the arrival of Octavianus his fleet and cavalry deserted, and his infantry was defeated. Deceived by a false report of her death which Cleopatra had disseminated, he fell upon his own sword (30 B.C.).—BIBLIOGRAPHY: Mommsen, *Roman History;* Plutarch, *Lives* (translated by Langhorne); De Quincey, *Essay on the Cæsars.*

**ANTONOMA'SIA.** In rhetoric, the use of the name of some office, dignity, profession, science, or trade instead of the true name of the person, as when *his majesty* is used for a king, *his lordship* for a nobleman; or when, instead of Aristotle, we say, *the philosopher*; or, conversely, the use of a proper noun instead of a common noun; as, a *Solomon* for a wise man.

**ANTONY, Mark.** *See* ANTONIUS (MARCUS).

**ANTONY, St.** *See* ANTHONY.

**AN'TRIM.** A county of Northern Ireland (Ulster), in he north-east of the island; area, 702,654 acres, of which about a third are arable. The eastern and northern districts are comparatively mountainous, with tracts of heath and bog, but no part rises to a great height. The principal rivers are the Lagan and the Bann, which separate Antrim from Down and Londonderry respectively. The general soil of the plains and valleys is strong loam. Flax, oats, and potatoes are the principal agricultural produce. Cattle, sheep, swine, and goats are extensively reared. There are salt-mines and beds of iron-ore, which is worked and exported.

A range of basaltic strata stretches along the northern coast, of which the celebrated Giant's Causeway is the most remarkable portion, the vast aggregates of natural rock pillars there being very striking. The interior also contains some scenes of picturesque beauty, particularly the fertile valley of the Lagan, between Belfast and Lisburn. Much of the scenery of the county, however, is dreary and monotonous. Lough Neagh, the largest lake of the United Kingdom, is principally in Antrim. Its waters are carried to the sea by the Bann, which is of no use for navigation, being obstructed by weirs and rocks. The spinning of linen and cotton yarn, and the weaving of linen and cotton, are the staple manufactures, but the cotton manufacture is small compared with that of linen.

The principal towns are Belfast, Lisburn, Ballymena, Larne, and Carrickfergus. In 1898 Belfast, the former capital, was constituted into a county borough. About fifty per cent of the inhabitants are Presbyterians, being the descendants of Scottish immigrants of the seventeenth century. The county sends four members to Parliament; Belfast returns nine. Pop. (excluding Belfast) 191,618 (1926).

The town of **Antrim**, at the north end of Lough Neagh, is a small place with a pop. of 1764.

**ANT-THRUSH.** A name given to certain passerine or perching birds having resemblances to the thrushes and supposed to feed largely on ants. They all have longish legs, short wings, and a short tail. The true ant-thrushes of the Old World belong to the genus Pitta. They chiefly inhabit

southern and south-eastern Asia and the Eastern Archipelago, but are also found in Africa and Australia, and are birds of brilliant plumage, exhibiting black, white, scarlet, blue, and green in vivid contrast, there being generally no blending of colours by means of intermediate hues. These birds are not now regarded as allied to the thrushes, nor are they allied to the ant-birds, or ant-thrushes of the New World, which live among close foliage and bushes. Some of these are called ant-shrikes and ant-wrens. They belong to several genera.

**ANTUNG.** Seaport of Manchuria. It is on the Yalu River, 7 miles from its mouth, and is connected by railway with Mukden and other places in the interior. It is a treaty port. Pop. 72,500.

**ANT'WERP** (Du. and Ger. *Antwerpen*, Fr. *Anvers*). The chief port of Belgium, and one of the first on the Continent, the capital of a province of the same name, on the Scheldt, about 50 miles from the open sea. It lies in a fertile plain at an abrupt turn of the river, which is here from 160 to 280 yards wide, and has a depth varying from 25 to 50 feet. It is strongly fortified, being completely surrounded on the land side by a semi-circular inner line of fortifications, the defences being completed by an outer line of forts and outworks. Fine quays have been constructed along the river banks.

**Appearance.** The general appearance of the city is exceedingly picturesque, an effect produced by the numerous churches, convents, and magnificent public buildings, the stately antique houses that line its older thoroughfares, and the profusion of beautiful trees with which it is adorned. The older streets are tortuous and irregular, but those in the newer quarters are wide and regular. Some of the squares are very handsome.

**Buildings.** The cathedral, with a spire 400 feet high, one of the largest and most beautiful specimens of Gothic architecture in Belgium, contains Rubens' celebrated masterpieces, *The Descent from the Cross*, *The Elevation of the Cross*, and *The Assumption*. The other churches of note are St. James's, St. Andrew's, and St. Paul's, all enriched with paintings by Rubens, Vandyck, and other masters. Among the other buildings of note are the exchange, the town hall, the palace, the theatre, academy of the fine arts, picture and sculpture galleries, etc.

**Shipping, etc.** The harbour accommodation is extensive and excellent, large new docks and quays having been recently built, and other works being under construction or contemplated. The shipping trade is now very large, Antwerp being a great centre of the world's commerce, and the goods being largely in transit. The entries of vessels in a year aggregate over 23,000,000 tons. Much of the trade is with Britain. There are numerous but not very important industries.

**History.** Antwerp is mentioned as early as the eighth century, and in the eleventh and twelfth it had attained a high degree of prosperity. In the sixteenth century it is said to have had a pop. of 200,000, and it had then an extensive foreign trade. The wars between the Netherlands and Spain greatly injured its commerce, which was almost ruined by the closing of the navigation of the Scheldt in accordance with the peace of Westphalia (1648). It was only in the nineteenth century that its prosperity revived. In the European War (1914-8), the Germans, under General von Beseler, entered Antwerp on 7th Oct., 1914, and remained there until Nov., 1918. Pop. (1926), 300,175. —The province consists of a fertile plain 1093 sq. miles in area, and has a pop. of over 1,100,000.

**ANU.** Babylonian god of heaven. At first worshipped as a local sky deity in Erech, he came to be regarded as supreme in a triad which included Bel of Nippur and Ea of Eridu, who were deemed to rule heaven, earth and sea respectively.

**ANU'BIS** (*Anepo* on the monuments). One of the deities of the ancient Egyptians, the son of Osiris by

Anubis, or ancient Egyptian deity

Isis. The Egyptian sculptures represent him with the head, or under the form, of a jackal, with long pointed ears. His office was to conduct the souls of the dead from this world to the next, and in the lower world he weighed the actions of the deceased previous to their admission to the presence of Osiris.

**ANÚPSHAHR** (*a*-nōp'shär). A town of India, United Provinces, on the Ganges, 75 miles S.E. of Delhi, a resort of Hindu pilgrims who bathe in the Ganges. Pop. 15,000.

**ANU'RA, or ANOU'RA** (Gr. *an*, negative, *oura*, a tail). An ord. of Batrachians which lose the tail when they reach maturity, such as the frogs and toads.

**ANURADHAPURA.** *See* ANARAJAPURA.

**A'NUS.** The opening at the lower or posterior extremity of the alimentary canal through which the excrement or waste products of digestion are expelled.

**AN'VIL.** An instrument on which pieces of metal are laid for the purpose of being hammered. The common smith's anvil is generally made of seven pieces, namely, the core or body; the four corners for the purpose of enlarging its base; the projecting end, which contains a square hole for the reception of a set or chisel to cut off pieces of iron; and the beak or conical end, used for turning pieces of iron into a circular form, etc. These pieces are each separately welded to the core and hammered so as to form a regular surface with the whole. When the anvil has received its due form, it is faced with steel, and is then tempered in cold water. The smith's anvil is generally placed loose upon a wooden block. The anvil for heavy operations, such as the forging of ordnance and shafting, consists of a huge iron block deeply embedded, and resting on piles of masonry.

**ANVILLE, Jean Baptiste Bourguignon d'** (jäṇ bäp-tēst bör-gē-nyōṇ däṇ-vēl). A celebrated French geographer, born 1697, died 1782; published a great number of maps and writings illustrative of ancient and modern geography.

**ANYNAKS.** A negro tribe inhabiting the banks of the Upper Sobat (a tributary of the White Nile), between the Egyptian Sudan and Abyssinia. They rebelled against British authority in 1912.

**ANZACS.** A composite word used as the name of the British colonial troops in the Gallipoli undertaking. The men being from Australia and New Zealand, their organization was officially known as the Australian-New Zealand Army Corps. The full title, however, was much too cumbersome, and a clerk in one of the headquarters offices at Zeitoun, where the troops were in training, hit upon the word *Anzacs*, formed from the initial letters of the long title. The Anzacs landed near Gaba Tepe, Gallipoli, on the morning of 25th April, 1915, and had their first encounter with the Germans on the Western Front on 6th May, 1916. In 1916 the word Anzac was officially adopted by the War Office.

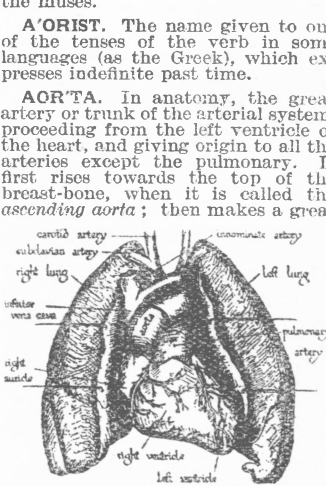
**ANZIN** (äṇ-zaṇ). A town of France, department of Nord, about 1 mile north-west of Valenciennes, in the centre of an extensive coal-field, with blast-furnaces, forges, rolling-mills, foundries, etc. Pop. 14,325.

**AOMORI.** Seaport of Japan. It stands on the north shore of Hondo Island on Aomori Bay and is a railway terminus. There is a good harbour improved in the 20th century. The port was opened to foreign trade in 1906. Pop. 58,800.

**AONIA.** In ancient geography a name for part of Bœotia in Greece, containing Mount Helicon and the fountain Aganippe, both haunts of the muses.

**A'ORIST.** The name given to one of the tenses of the verb in some languages (as the Greek), which expresses indefinite past time.

**AOR'TA.** In anatomy, the great artery or trunk of the arterial system, proceeding from the left ventricle of the heart, and giving origin to all the arteries except the pulmonary. It first rises towards the top of the breast-bone, when it is called the *ascending aorta*; then makes a great




Position of the Aorta

curve, called the transverse or *great arch of the aorta*, whence it branches off to the head and upper extremities; thence proceeding towards the lower

extremities, under the name of the *descending aorta*, it branches off to the trunk; and finally divides into the two iliacs, which supply the pelvis and lower extremities.

**AOSTA** (ȧ os'tȧ; ancient **AUGUSTA PRÆTORIA**). A town of north Italy, 50 miles N.N.W. of Turin, on the Dora-Baltea, with an ancient triumphal arch, remains of an amphitheatre, etc. Pop. 7000.

**AOUDAD** (a-ö'dad). The *Ammotragus tragelaphus*, a quadruped allied to the sheep, most closely to the moufion, from which, however, it may be easily distinguished by the heavy mane, commencing at the throat and falling as far as the knees. It is a native of North Africa, inhabiting the loftiest and most inaccessible rocks.

**APACHES** (ȧ-pä'chez). A warlike race of North-American Indians, numbering between 5000 and 6000, and inhabiting Arizona, New Mexico, and Oklahoma. The final surrender of the tribe took place in 1886, but a few in Mexico still maintain their independence and hostility to the whites. The name *Apache* was assumed by Parisian hooligans, notorious for their criminal outrages.

**AP'ANAGE.** An allowance which the younger princes of a reigning house in some European countries receive from the revenues of the country, generally together with a grant of public domains, that they may be enabled to live in a manner becoming their rank.

**AP'ATITE.** A translucent but seldom transparent mineral, which crystallizes in ε regular six-sided prism, usually terminated by a truncated six-sided pyramid. It passes through various shades of colour, from white to yellow, green, blue, and occasionally red, scratches fluor-spar but is scratched by felspar, and has a specific gravity of about 3.5. It is a compound of calcium phosphate with calcium fluoride or chloride. It occurs principally in igneous rocks, particularly diorites. The very coarse-grained granites of Ontario contain apatite crystals of corresponding size, which have been picked out as a source of artificial phosphate manures. Apatite supplies to soils almost all the phosphorus available for plants in a state of nature.

**APE.** A common name of a number of quadrumanous animals inhabiting the Old World (Asia and the Asiatic Islands, and Africa), and including a variety of species. The word *ape* was formerly applied indiscriminately to all quadrumanous mammals; but it is now limited to

Ape

the anthropoid or man-like monkeys. The family includes the chimpanzee, gorilla, orang-outang, etc., and has been divided into three genera, Troglodytes, Simia, and Hylobates. *See* CHIMPANZEE, GIBBON, GORILLA, MONKEY, ORANG, etc.

**APELDOORN** (ȧ'pel-dōrn). A town of Holland, province of Guelderland, 17 miles north of Arnhem, with manufactures of paper. The royal palace Loo is here. Pop. 51,388.

**APELLES** (a-pel'ēz). The most famous of the painters of ancient Greece and of antiquity, was born in the fourth century B.C., probably at Colophon. Ephorus of Ephesus was his first teacher, but attracted by the renown of the Sicyonian school he went and studied at Sicyon. In the time of Philip he went to Macedonia, and there a close friendship between him and Alexander the Great was established. He died about the end of the century.

The most admired of his pictures was that of Venus rising from the sea and wringing the water from her dripping locks. His portrait of Alexander with a thunderbolt in his hand was no less celebrated.

Among the anecdotes told of Apelles is the one which gave rise to the Latin proverb, "Ne sutor ultra crepidam"—"Let not the shoemaker go beyond the shoe." Having heard a cobbler point out an error in the drawing of a shoe in one of his pictures

he corrected it, whereupon the cobbler took upon him to criticize the leg, and received from the artist the famous reply.

**AP'ENNINES** (Lat. *Mons Apenninus*). A prolongation of the Alps, forming the "backbone of Italy." Beginning at Savona, on the Gulf of Genoa, the Apennines traverse the whole of the peninsula and also cross over into Sicily, the Strait of Messina being regarded merely as a gap in the chain. The average height of the mountains composing the range is about 4000 feet, and nowhere do they reach the limits of perpetual snow, though some summits exceed 9000 feet in height. Monte Corno, called also Gran Sasso d'Italia (Great Rock of Italy), which rises among the mountains of the Abruzzi, is the loftiest of the chain, rising to the height of 9541 feet, Monte Majella (9151) being next. Monte Gargano, which juts out into the Adriatic from the *ankle* of Italy, is a mountainous mass upwards of 5000 feet high, completely separated from the main chain.

On the Adriatic side the mountains descend more abruptly to the sea than on the western or Mediterranean side, and the streams are comparatively short and rapid. On the western side are the valleys of the Arno, Tiber, Garigliano, and Volturno, the largest rivers that rise in the Apennines, and the only ones of importance in the peninsular portion of Italy. They consist almost entirely of limestone rocks, and are exceedingly rich in the finest marbles. On the south slopes volcanic masses are not uncommon. Mount Vesuvius, the only active volcano on the continent of Europe, is an instance. The lower slopes are well clothed with vegetation, the summits are sterile and bare.

**APENRADE** (ä'pen-rä-de). A seaport in Schleswig-Holstein, on a fiord of the Little Belt, beautifully situated, and carrying on a considerable fishing industry. Pop. 7800.

**APE'RIENT.** A medicine which, in moderate doses, gently but completely opens the bowels: examples, castor-oil, Epsom salts, senna, etc.

**APET'ALOUS.** A botanical term applied to flowers or flowering-plants which are destitute of petals or corolla.

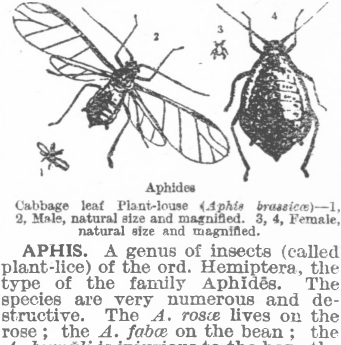
**APHANIP'TERA.** An order of wingless insects, composed of the different species of fleas. *See* FLEA.

**APHA'SIA** (Gr. *a*, not, and *phasis*, speaking). In pathology, a symptom of certain morbid conditions of the nervous system, in which the patient loses the power of expressing ideas by means of words, or loses the appropriate use of words, the vocal organs the while remaining intact and the intelligence sound. There is sometimes an entire loss of words as connected with ideas, and sometimes only the loss of a few. In one form of the disease, called *aphemia*, the patient can think and write, but cannot speak; in another, called *agraphia*, he can think and speak, but cannot express his ideas in writing. In a great majority of cases, where post-mortem examinations have been made, morbid changes have been found in the left frontal convolution of the brain.

**APHE'LION** (Gr. *apo*, from, and *hēlios*, the sun). That point of the orbit of the earth or any other planet which is remotest from the sun.

**APHE'MIA.** *See* APHASIA.

**APHIDES** (af'i-dēz). *See* APHIS.




Aphides

Cabbage leaf Plant-louse (*Aphis brassicæ*)—1, 2, Male, natural size and magnified. 3, 4, Female, natural size and magnified.

**APHIS.** A genus of insects (called plant-lice) of the ord. Hemiptera, the type of the family Aphidēs. The species are very numerous and destructive. The *A. rosæ* lives on the rose; the *A. fabæ* on the bean; the *A. humŭli* is injurious to the hop, the *A. granaria* to cereals, and *A. lanigĕra* or woolly aphis equally so to apple trees. The aphides are furnished with an inflected beak, and feelers longer than the thorax. In the same species some individuals have four erect wings and others are entirely without wings. The feet are of the ambulatory kind, and the abdomen usually ends in two horn-like tubes, from which is ejected the substance called honey-dew, a favourite food of ants. (*See* ANT).

The aphides illustrate parthenogenesis; hermaphrodite forms produced from eggs produce viviparous wingless forms, which again produce others like themselves, and thus multiply during summer, one individual giving rise to millions. Winged sexual forms appear late in autumn, the females of which, being impregnated by the males, produce eggs.

**APHO'NIA** (Gr. *a*, not, and *phōnē*, voice). In pathology, the greater or less impairment, or the complete loss of the power of emitting vocal sound. The slighter and less permanent forms often arise from extreme nervousness, fright, and hysteria. Slight forms of structural aphonia are of a catarrhal nature, resulting from more or less congestion and tumefaction of the mucous and submucous tissues of the larynx and adjoining parts. Severer cases are frequently occasioned by serous infiltration into the submucous tissue, with or without inflammation of the mucous membrane of the larynx and of its vicinity. The voice may also be affected in different degrees by inflammatory affections of the fauces and tonsils; by tumours in these situations; by morbid growths pressing on or implicating the larynx or trachea; by aneurisms; and most frequently by chronic laryngitis and its consequences, especially thickening, ulceration, etc.

**APH'ORISM.** A brief, sententious saying, in which a comprehensive meaning is involved, as "Familiarity breeds contempt"; "Necessity has no law."

**APHRODITE** (af-ro-dī'tē). The goddess of love among the Greeks; counterpart of the Roman Venus. A festival called Aphrodisia was celebrated in her honour in various parts of Greece, but especially in Cyprus. *See* VENUS.

**APHTHÆ** (af'thē). A disease occurring especially in infants, but occasionally seen in old persons, and consisting of small white ulcers upon the tongue, gums, inside of the lips, and palate, resembling particles of curdled milk; commonly called *thrush* or *milk-thrush*.

**A'PIA.** The chief place and trading centre of the Samoa Islands on the north side of the Island of Upolu. It has a wireless station.

**A'PIARY** (Lat. *apis*, a bee). A place for keeping bees. The apiary should be well sheltered from strong winds, moisture, and the extremes of heat and cold. The hives should face the south or south-east, and should be placed on shelves 2 feet above the ground, and about the same distance from each other. There is no place for handling bees like the open air in suitable weather, and for this reason bee-houses, or bee-sheds, formerly in use, are not much in vogue now.

**Hives.** As to the form of the hives and the materials of which they should be constructed there are great differences of opinion. The old dome-shaped straw *skep* is still in general use among the cottagers of Great Britain. Its cheapness and simplicity of construction are in its favour, while it is excellent for warmth and ventilation; but it has the disadvantage that its interior is closed to inspection, and the honey can only be got out by stupefying the bees with the smoke of the common puffball or chloroform, or by fumigating with sulphur, which entails the destruction of the swarm. Wooden hives of square box-like form are now gaining general favour among bee-keepers. They usually consist of a large breeding chamber below and two sliding removable boxes called "supers" above for the abstraction of honey without disturbing the contents of the main chamber. It is of great importance that the apiary should be situated in the neighbourhood of good feeding grounds, such as gardens, clover-fields, or heath-covered hills.

**Feeding.** When their stores of honey are removed, the bees must be fed during the winter and part of spring with syrup or with a solution consisting of 2 lb. loaf-sugar to a pint of water. In the early spring slow and continuous feeding (a few ounces of syrup each day) will stimulate the queen to deposit her eggs, by which means the colony is rapidly strengthened and throws off early swarms. New swarms may make their appearance as early as May and as late as August, but swarming usually takes place in the intervening months. *See* BEE-KEEPING.

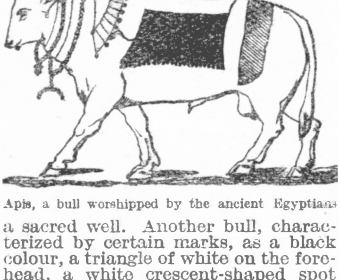
**APIC'IUS, Marcus Gabius.** A Roman epicure in the time of Augustus and Tiberius, who, having exhausted his vast fortune on the gratification of his palate, and having *only* about £80,000 left, poisoned himself that he might escape the misery of plain diet. The book of cookery published under the title of *Apicius* was written by one Cælius, and belongs to a much later date.

**A'PION.** A Greek grammarian, born in Egypt, lived in the reigns of Tiberius, Caligula, and Claudius, A.D. 15-54, and went to Rome to teach grammar and rhetoric. Among his works, one or two fragments only of which remain, was one directed against the Jews, which was replied to by Josephus.

**A'PIOS.** A genus of leguminous climbing plants, producing edible tubers on underground shoots. An American species (*A. tuberōsa*) has been used as a substitute for the potato, but its tubers, though numerous, are small.

**A'PIS.** A bull to which divine honours were paid by the ancient Egyptians, who regarded him as a

symbol of Osiris. At Memphis he had a splendid residence, containing extensive walks and courts for his entertainment, and he was waited upon by a large train of priests, who looked upon his every movement as oracular. He was not suffered to live beyond twenty-five years, being secretly killed by the priests and thrown into



Apis, a bull worshipped by the ancient Egyptians

a sacred well. Another bull, characterized by certain marks, as a black colour, a triangle of white on the forehead, a white crescent-shaped spot on the right side, etc., was selected in his place. His birthday was annually celebrated, and his death was a season of public mourning. *See* ANIMAL WORSHIP.

**A'PIS.** A genus of insects. *See* BEE.

**A'PIUM.** A genus of umbelliferous plants, including celery.

**APLACEN'TAL.** *See* PLACENTA, MARSUPIALIA, and ECHIDNA.

**APLANAT'IC.** *See* OPTICS, PHOTOGRAPHY.

**APLYSIA.** *See* SEA-HARE.

**APOC'ALYPSE** (Gr. *apokalypsis*, a revelation). The name given to the last book of the New Testament, in the English version called The Revelation of St. John the Divine. Although a Christian work, the *Apocalypse* belongs to a class of literature dealing with eschatological subjects and much in vogue among the Jews of the first century B.C. It is generally believed that the *Apocalypse* was written by the apostle John in his old age (A.D. 95-97) in the Isle of Patmos, whither he had been banished by the Roman Emperor Domitian. Anciently its genuineness was maintained by Justin Martyr, Irenæus, Clement of Alexandria, Tertullian and many others; while it was doubted by Dionysius of Alexandria, Cyril of Jerusalem, Chrysostom, and, nearer our own times, by Luther.

Interpretation. The *Apocalypse* has been explained differently by almost every writer who has ventured to interpret it, and has furnished all sorts of sects and fanatics with quotations to support their creeds or pretensions. The modern interpreters may be divided into three schools—namely, the *historical school*, who hold that the prophecy embraces the whole history of the Church and its foes from the time of its writing to the end of the world; the *Præterists*, who hold that the whole or nearly the whole of the prophecy has been already fulfilled, and that it refers chiefly to the triumph of Christianity over Paganism and Judaism; and the *futurists*, who throw the whole prophecy, except the first three chapters, forward upon a time not yet reached by the Church—a period of no very long duration, which is immediately to precede Christ's second coming. *See* BIBLE—BIBLIOGRAPHY: R. H. Charles, *Studies in the Apocalypse*; F. C. Burkitt, *Jewish and Christian Apocalypses*.

**APOCALYPT'IC NUMBER.** The mystic number 666 found in Rev. xiii. 18. As early as the second century ecclesiastical writers found that the name Antichrist was indicated by the Greek characters expressive of this number. By Irenæus the word *Lateinos* was found in the letters of the number, and the Roman Empire was therefore considered to be Antichrist. Protestants generally believe it has reference to the Papacy, and, on the other hand, Catholics connect it with Protestantism. It is, however, almost certain that the number refers to Nero, for by transliterating the Greek *Kaisar Neron* into Hebrew, and adding together the sums denoted by the Hebrew letters, we obtain the numbers 666.

**APOCAR'POUS.** In botany, a term applied to such fruits as are the produce of a single flower, and are formed of one carpel, or a number of carpels free and separate from each other.

**APOC'RYPHA** (Gr., "things concealed or spurious"). A term applied in the earliest churches to various sacred or professedly inspired writings, sometimes given to those whose authors were unknown, sometimes to those with a hidden meaning, and sometimes to those considered objectionable.

The term is specially applied to the fourteen undermentioned books, which were written during the two centuries preceding the birth of Christ. They were written, not in Hebrew, but in Greek, and the Jews never allowed them a place in their sacred canon. They were incorpor-

ated into the Septuagint, and thence passed to the Vulgate. The Greek Church excluded them from the canon in 360 at the Council of Laodicea. The Latin Church treated them with more favour, but it was not until 1546 that they were formally admitted into the canon of the Church of Rome by a decree of the Council of Trent. The Anglican Church says they may be read for example of life and instruction of manners, but that the Church does not apply them to establish any doctrine. All other Protestant churches in Britain and America ignore them.

The following fourteen books form the Apocrypha of the English Bible: The first and second *Books of Esdras*, *Tobit*, *Judith*, the rest of the *Book of Esther*, the *Wisdom of Solomon*, the *Wisdom of Jesus the son of Sirach*, or *Ecclesiasticus*, *Baruch the Prophet*, the *Song of the Three Children*, *Susanna and the Elders*, *Bel and the Dragon*, the *Prayer of Manasses*, and the first and second *Books of Maccabees*.

Besides the Apocryphal books of the Old Testament there are many spurious books composed in the earlier ages of Christianity, and published under the names of Christ and his apostles, or of such immediate followers as from their character or means of intimate knowledge might give an apparent plausibility to such forgeries. These writings comprise: 1st, the *Apocryphal Gospels*, which treat of the history of Joseph and the Virgin before the birth of Christ, of the infancy of Jesus, and of the acts of Pilate; 2nd, the *Apocryphal Acts of the Apostles;* and 3rd, the *Apocryphal Apocalypses*, none of which have obtained canonical recognition by any of the churches. —BIBLIOGRAPHY: Wace, *The Apocrypha*; Porter, in Hastings' *Bible Dict.*, i. pp. 111-23; W. D. F. Oesterley, *Book of the Apocrypha*; R. H. Charles, *Religious Development between the Old and the New Testaments*.

**APOCYNA'CEÆ.** A nat. ord. of dicotyledonous plants, having for its type the genus Apocynum or dogbane. The species have opposite or sometimes whorled leaves without stipules; the corolla monopetalous, hypogynous, and with the stamens inserted upon it; fruit two-celled. The plants yield a milky juice, which is generally poisonous; several yield caoutchouc, and a few edible fruits. The bark of several species is a powerful febrifuge. To the order belongs the periwinkle (Vinca). *See* COW-TREE, PERIWINKLE, OLEANDER, TANGHIN.

**APO'DA.** *See* PROTEOLEPADIDÆ.

**AP'ODAL FISHES.** The name applied to such malacopterous fishes as want ventral fins. They constitute a small natural family, of which the common eel is an example.

**APO'DŌSIS.** In grammar, the latter member of a conditional sentence (or one beginning with *if*, *though*, etc.) dependent on the condition or *protasis*; as, if it rain (*protasis*) I shall not go (*apodosis*).

**AP'OGEE** (-jē; Gr. *apo*, from, and *gē*, the earth). That point in the orbit of the moon or a planet where it is at its greatest distance from the earth; also the greatest distance of the sun from the earth when the latter is in *aphelion*.

**APOL'DA.** A town of Germany, in Saxe-Weimar, at which woollen goods are extensively manufactured. Pop. 22,610.

**APOLLINA'RIANS.** A sect of Christians who maintained the doctrine that Christ had a human body and a human sensitive soul, but no human rational mind, the Divine Logos (the Word) taking the place of the mind, and that God was consequently united in him with the human body and the sensitive soul. Apollinaris, the author of this opinion, was, from A.D. 362 till at least A.D. 382, Bishop of Laodicea, in Syria, and a zealous opposer of the Arians. As a man and a scholar he was highly esteemed, and was among the most popular authors of his time. He formed a congregation of his adherents at Antioch, and made Vitalis their bishop. The *Apollinarians*, or *Vitalians*, as their followers were called, soon spread their settlements in Syria and the neighbouring countries, established several societies, with their own bishops, and one even in Constantinople; but many adherents drifted away to Monophysitism, and the sect soon became extinct.

**APOLLINA'RIS WATER.** A natural aerated water, belonging to the class of acidulated soda waters, and derived from the Apollinarisbrunnen, a spring in the valley of the Ahr, near the Rhine, in Rhenish Prussia, forming a highly-esteemed beverage.

**APOL'LO.** Son of Zeus (Jupiter) and Leto (Latona), who, being persecuted by the jealousy of Hera (Juno), after tedious wanderings and nine days' labour, was delivered of him and his twin sister, Artĕmis (Diana), on the Island of Delos.

**Feats.** Skilled in the use of the bow, he slew the serpent Python on the fifth day after his birth; afterwards, with his sister Artĕmis, he killed the children of Niobē. He aided Zeus in the war with the Titans and the

Apollo Belvedere (Vatican, Rome)

giants. He destroyed the Cyclopes, because they forged the thunderbolts with which Zeus killed his son and favourite Asklepios (Æsculapius). According to some traditions he invented the lyre, though this is generally ascribed to Hermes (Mercury).

The brightest creation of polytheism, Apollo is also the most complex, and many aspects of the people's life were reflected in his cult. He was originally the sun-god; and though in Homer he appears distinct from Helios (the sun), yet his real nature is hinted at even here by the epithet Phœbus, that is, the radiant or beaming. In later times the view was almost universal that Apollo and Helios were identical. From being the god of light and purity in a physical sense, he gradually became the god of moral and spiritual light and purity, the source of all intellectual, social, and political progress. He thus came to be regarded as the god of song and prophecy, the god that wards off and heals bodily suffering and disease, the institutor and guardian of civil and political order, and the founder of cities. His worship was introduced at Rome at an early period, probably in the time of the Tarquins.

**Statues.** Among the ancient statues of Apollo that have come down to us, the most remarkable is the one called *Apollo Belvedere*, from the Belvedere Gallery in the Vatican at Rome. This statue was discovered at Frascati in 1455, and purchased by Pope Julian II., the founder of the Vatican museum. It is a copy of a Greek statue of the third century B.C., and dates probably from the reign of Nero.

**APOLLODO'RUS.** A Greek writer who flourished 140 B.C. Among the numerous works he wrote on various subjects, the only one extant is his *Bibliothecê*, which contains a concise account of the mythology of Greece down to the heroic age.

**APOLLO'NIUS OF PERGA.** Greek mathematician, called the "great geometer," flourished about 240 B.C., and was the author of many works, only one of which, a treatise on *Conic Sections*, partly in Greek and partly in an Arabic translation, is now extant.

**APOLLO'NIUS OF RHODES.** A Greek rhetorician and poet, flourished about 230 B.C. Of his various works we have only the *Argonautica*, an epic poem of considerable merit, though perhaps written with too much care and labour. It deals with the story of the Argonautic expedition.

**APOLLO'NIUS OF TY'ANA.** In Cappadocia, a Pythagorean philosopher who was born in the beginning of the Christian era, early adopted the Pythagorean doctrines, abstaining from animal food and maintaining a rigid silence for five years. He travelled extensively in Asia, professed to be endowed with miraculous powers, such as prophecy and the raising of the dead, and was on this account set up by some as a rival to Christ. His ascetic life, wise discourses, and wonderful deeds obtained for him almost universal reverence, and temples, altars, and statues were erected to him. He died at Ephesus about the end of the first century. A narrative of his strange career, containing many fables, with, perhaps, a kernel of truth, was written by Philostratus about a century later.

**APOLLO'NIUS OF TYRE.** The hero of a tale which had an immense popularity in the Middle Ages and which indirectly furnished the plot of Shakespeare's *Pericles, Prince of Tyre*. The story, originally in Greek, first appeared in the third century after Christ.

**APOLL'OS.** A Jew of Alexandria, who learned the doctrines of Christianity at Ephesus from Aquila and Priscilla, became a preacher of the gospel in Achaia and Corinth, and an assistant of Paul in his missionary work. Some have regarded him as the author of the Epistle to the Hebrews.

**APOLL'YON** ("the Destroyer"). A name used in Rev. ix. 11 for the angel of the bottomless pit.

**APOLOGETICS** (-jet'iks). This term, as used in Christian theology, does not carry with it the idea of excuse or regretful acknowledgment, but signifies a defensive or vindicatory statement, which accords with its meaning in the original Greek. In the conventional division of systematic theology apologetics comes first in order, and is followed by the disciplines of dogmatics and ethics, which expound Christian belief and Christian duty respectively.

There is a tendency, however, in the more recent treatment of systematic theology, to include the defence or vindication of the various Christian doctrines within the dogmatic scheme, leaving to apologetics —in so far as it may be regarded as a separate discipline from dogmatics— the discussion of such general themes as religion and revelation, authority and inspiration, and the essence and truth of Christianity. Such discussions belong essentially to what is now often called philosophy of religion. The preference of the term philosophy of religion to that of apologetics is indicative at once of the wider theological outlook of our time and of the conciliatory, adaptable, and more sympathetic spirit in which the Christian apologist approaches the new thought and culture.—BIBLIOGRAPHY: A. B. Bruce, *Apologetics*; R. Mackintosh, *First Primer of Apologetics*; J. R. Illingworth, *Reason and Revelation*; A. E. Garvie, *A Handbook of Christian Apologetics*.

**APOLOGUE** (ap'o-log). A story or relation of fictitious events intended to convey some useful truths. It differs from a parable in that the latter is drawn from events that take place among mankind, whereas the apologue may be founded on supposed actions of brutes or inanimate things. Æsop's fables are good examples of apologues.

**APOL'OGY.** A term at one time applied to a defence of one who is accused, or of certain doctrines called in question. Of this nature is the *Apology of Socrates* written by Plato; also a work with the same title sometimes attributed to Xenophon. The name passed over to Christian authors, who gave the name of apologies to the writings which were designed to defend Christianity against the attacks and accusations of its enemies, particularly the pagan philosophers, and to justify its professors before the emperors. Of this sort were those by Justin Martyr, Athenagoras, Tertullian, Tatian, and others.

**APONEURO'SIS.** In anatomy, a name of certain greyish-white shining membranes, composed of interlacing fibres, sometimes continuous with the muscular fibre, and differing from tendons merely in having a flat form. They serve several purposes, sometimes attaching the muscles to the bones, sometimes surrounding the muscle and preventing its displacement, etc. *See* ANATOMY.

**APOPHTHEGM** (ap'o-them). A short pithy sentence or maxim. Julius Cæsar wrote a collection of them, and we have a collection by Francis Bacon.

**APOPH'YLLITE.** A species of mineral of a foliated structure and pearly lustre, called also fish-eye stone. It belongs to the Zeolite family, and is a hydrated silicate of lime and potash, containing also fluorine.

**AP'OPLEXY.** Sudden abolition of consciousness, followed after recovery of consciousness by persistent disturbance of sensation or voluntary motion, from suspension of the functions of the cerebrum, resulting from blocking or rupture of the blood-vessels of the brain. In a complete apoplexy the person falls suddenly, is unable to move his limbs or to speak, gives no proof of seeing hearing, or feeling, and the breathing is stertorous or snoring, like that of a person in deep sleep.

**Symptoms.** The premonitory symptoms of this dangerous disease are drowsiness, giddiness, dullness of hearing, frequent yawning, disordered vision, noise in the ears, vertigo, etc. It is most frequent between the ages of fifty and seventy. A large head, short neck, full chest, sanguine and plethoric constitution, and corpulency are generally considered signs of predisposition to it; but the state of the heart's action, with a plethoric condition of the vascular system, has a more marked influence. Out of sixty-three cases carefully investigated only ten were fat and plethoric, twenty-three being thin, and the rest of ordinary habit.

**Causes.** The common predisposing causes are disease or senile changes in the blood-vessels and affections of the valves of the heart; but other factors may possibly play some part either as exciting or predisposing causes, such as long and intense thought, continued anxiety, habitual indulgence of the temper and passions, sedentary and luxurious living, sexual indulgence, intoxication, etc. More or less complete recovery from a first and second attack is common, but a third is almost invariably fatal.—Cf. Grasset, *Traité du système nerveux*.

**APOSIOPE'SIS.** In rhetoric, a sudden break or stop in speaking or

writing, usually for mere effect or a pretence of unwillingness to say anything on a subject; as, "his character is such—but it is better I should not speak of *that*," or Virgil's "Quos ego—sed motos praestat componere fluctus" (*Aen.* I. 135).

**APOS'TASY** (Gr. *apostasis*, a standing away from). A renunciation of opinions or practices and the adoption of contrary ones, usually a plied to renunciation of religious opinions. It is always an expression of reproach. What one party calls *apostasy* is termed by the other *conversion*. Catholics, also, call those persons *apostates* who forsake a religious order or renounce their religious vows without a lawful dispensation.

**A POSTERIO'RI.** *See* A PRIORI.

**APOS'TLES** (literally, persons sent out, from the Gr. *apostellein*, to send out). The twelve men whom Jesus selected to attend him during his ministry, and to promulgate his religion.

**Twelve Apostles.** Their names were as follows: Simon Peter, and Andrew his brother; James, and John his brother, sons of Zebedee; Philip; Bartholomew; Thomas; Matthew; James, the son of Alpheus; Lebbæus his brother, called *Judas* or *Jude*; Simon, the Canaanite; and Judas Iscariot. To these were subsequently added Matthias (chosen by lot in place of Judas Iscariot) and Paul. The Bible gives the name of apostle to Barnabas also, who accompanied Paul on his missions (Acts xiv. 14). During the life of the Saviour the apostles more than once showed a misunderstanding of the object of His mission, and during His sufferings evinced little courage and firmness of friendship for their great and benevolent Teacher. After His death they received the Holy Ghost on the day of Pentecost, that they might be enabled to fulfil the important duties for which they had been chosen. According to one interpretation of Matthew xvi. 18, Christ seems to appoint St. Peter the first of the apostles; and the Pope claims supreme authority from the power which Christ thus gave to St. Peter, of whom all the Popes, according to the Catholic dogma, are successors in an uninterrupted line.

**Other apostles.** In a wider sense those preachers who first taught Christianity in heathen countries are sometimes termed apostles; for example, St. Denis, the apostle of the Gauls; St. Boniface, the apostle of Germany; St. Augustine, the apostle of England; Francis Xavier, the apostle of the Indies; Adalbert of Prague, apostle of Prussia Proper.

**APOSTLES' CREED.** A well-known formula or declaration of Christian belief, formerly believed to be the work of the apostles themselves, but it can only be traced to the fourth century. *See* CREED.

**APOSTOL'IC, or APOSTOL'ICAL.** Pertaining or relating to the apostles.

**Apostolic Church.** The Church in the time of the apostles constituted according to their design. The name is also given to the four churches of Rome, Alexandria, Antioch, and Jerusalem, and is claimed by the Roman Catholic Church, and occasionally by the Episcopalians.

**Apostolic Constitutions and Canons.** A collection of regulations attributed to the apostles, but generally supposed to be spurious. They appeared in the fourth century, are divided into eight books, and consist of rules and precepts relating to the duty of Christians, and particularly to the ceremonies and discipline of the Church.

**Apostolic fathers.** The Christian writers who during any part of their lives were contemporary with the apostles. There are five—Clement, Barnabas, Hermas, Ignatius, Polycarp.

**Apostolic king.** A title granted by the Pope to the kings of Hungary, first conferred on St. Stephen, the founder of the royal line of Hungary, on account of what he accomplished in the spread of Christianity.

**Apostolic see.** The see of the Popes or Bishops of Rome; so called because the Popes profess themselves the successors of St. Peter, its founder.

**Apostolic succession.** The uninterrupted succession of bishops, and, through them, of priests and deacons (these three orders of ministers being called the *apostolical orders*), in the Church by regular ordination from the first apostles down to the present day. All Episcopal churches hold theoretically, and the Roman Catholic Church and many members of the English Church strictly, that such succession is essential to the officiating priest, in order that grace may be communicated through his administrations.

**APOSTOL'ICS, APOSTOLICI, or APOSTOLIC BRETHREN.** The name given to certain sects who professed to imitate the manners and practice of the apostles. The last and most important of these sects was founded about 1260 by Gerhard Segarelli of Parma. They went barefooted, begging, preaching, and singing throughout Italy, Switzerland, and France; announced the coming of the kingdom of heaven and of purer times; denounced the papacy, and its corrupt and worldly church; and inculcated

the complete renunciation of all worldly ties, of property, settled abode, marriage, etc.

This society was formally abolished, 1286, by Honorius IV. In 1300 Segarelli was burned as a heretic, but another chief apostle appeared—Dolcino, a learned man of Milan. In self-defence they stationed themselves in fortified places whence they might resist attacks. After having devastated a large tract of country belonging to Milan they were subdued, A.D. 1307, by the troops of Bishop Raynerius, in their fortress Zebello, in Vercelli, and almost all destroyed. Dolcino was burned. The survivors afterwards appeared in Lombardy and in the south of France as late as 1368.

**APO'STROPHÊ** (Gr., "a turning away from"). A rhetorical figure by which the orator changes the course of his speech, and makes a short impassioned address to one absent as if he were present, or to things without life and sense as if they had life and sense. The same term is also applied to a comma when used to contract a word, or to mark the possessive case, as in "John's book."

**APOTHECARIES' WEIGHT.** The weight used in dispensing drugs, in which the pound (lb.) is divided into 12 ounces (℥), the ounce into 8 drachms (ʒ), the drachm into 3 scruples (℈), and the scruple into 20 grains (grs.), the grain being equivalent to that in avoirdupois weight.

**APOTH'ECARY.** In a general sense, one who keeps a shop or laboratory for preparing, compounding, and vending medicines, and for the making up of medical prescriptions.

**History.** In England the term was long applied (as to some little extent still) to a regularly licensed class of medical practitioners, being such persons as were members of, or licensed by, the **Apothecaries' Company** in London. The apothecaries of London were at one time ranked with the grocers, with whom they were incorporated by James I. in 1606. In 1617, however, the apothecaries received a new charter as a distinct company. They were not yet regarded as having the right to prescribe, but only to dispense, medicines; but in 1703 the House of Lords conferred that right on them, and they afterwards became a well-established branch of the medical profession.

In 1815 an Act was passed providing that no person should practise as an apothecary in any part of England or Wales unless after serving an apprenticeship of five years with a member of the society, and receiving a certificate from the society's examiners. As in country places every practitioner must be to some extent an apothecary, this Act gave the society an undue influence over the medical profession. Dissatisfaction therefore long prevailed, but nothing of importance was done till the Medical Act of 1858, which brought the desired reform.

The **Apothecaries' Society,** governed by a master, two wardens, and twenty-two assistants, has prescribed a course of medical instruction and practice which candidates for the licence of the society must pass through. Since 1874 apprenticeship has not been necessary.

**APOTHE'CIUM.** In botany, the receptacle of lichens, consisting of the spore-cases or asci, and of the paraphyses or barren threads.

**APOTHEO'SIS** (deification). A solemnity among the ancients by which a mortal was raised to the rank of the gods. The custom of placing mortals who had rendered their countrymen important services, among the gods was very ancient among the Greeks. The Romans, for several centuries, deified none but Romulus, and first imitated the Greeks in the fashion of frequent apotheosis after the time of Cæsar. From this period apotheosis was regulated by the decree of the senate, and accompanied with great solemnities. Almost all the Roman emperors were deified.

**APPALACHIAN MOUNTAINS** (appa-lā'chi-an), also called **ALLEGHANIES.** A vast mountain range in N. America extending for 1300 miles from Cape Gaspé, on the Gulf of St. Lawrence, S.W. to Alabama. The system has been divided into three

Map to show the routes through the Appalachians from the coalfields to the sea

great sections: the *northern* (including the Adirondacks, the Green Mountains, the White Mountains, etc.), from Cape Gaspé to New York; the *central* (including a large portion of the Blue Ridge, the Alleghanies proper, and numerous lesser ranges), from New York to the valley of the

New River; and the *southern* (including the continuation of the Blue Ridge, the Black Mountains, the Smoky Mountains, etc.), from the New River southwards.

The chain consists of several ranges generally parallel to each other, the altitude of the individual mountains increasing on approaching the south. The highest peaks rise over 6600 feet (not one at all approaching the snow-level), but the mean height is about 2500 feet. Lake Champlain is the only lake of great importance in the system, but numerous rivers of considerable size take their rise here.

**Minerals and Timber.** Magnetite, hematite, and other iron ores occur in great abundance, and the coal-measures are among the most extensive in the world. Gold, silver, lead, and copper are also found in small quantities, while marble, limest ne, fire-clay, gypsum, and salt abound. The forests covering many of the ranges yield large quantities of valuable timber, such as sugar-maple, white birch, beech, ash, oak, cherry tree, white poplar, white and yellow pine, etc., while they form the haunts of large numbers of bears, panthers, wild cats, and wolves.

**APPALACHICOLA** (-chi-cō'la). A river of the United States, formed by the Chattahoochee and Flint Rivers, which unite near the northern border of Florida; length, about 100 miles; it flows into the Gulf of Mexico, and is navigable.

**APPAM.** The name of a British merchant ship of the Elder-Dempster line captured by the German raiding cruiser *Moewe* (Sea-gull) on 16th Jan., 1916. A German prize crew succeeded in bringing the *Appam* westward, and was able to pass the British cordon off Chesapeake Bay and to reach Norfolk, Virginia. The vessel was carrying, among others, an ex-governor of Sierra Leone and some military officers from the west coast of Africa, but the passengers were at once released and allowed to return to England.

**APPANAGE.** *See* APANAGE.

**APPA'RENT.** Among mathematicians and astronomers, applied to things as they appear to the eye, in distinction to what they really are. Thus they speak of apparent motion, magnitude, distance, height, etc. The *apparent magnitude* of a heavenly body is the angle subtended at the spectator's eye by the diameter of that body, and this, of course, depends on the distance as well as the real magnitude of the body; *apparent motion* is the motion a body seems to have in consequence of our own motion, as the motion of the sun from east to west, etc.

**APPARITION.** According to a belief held by some, a disembodied spirit manifesting itself to mortal sight; according to the common theory an illusion involuntarily generated, by means of which figures or forms, not present to the actual sense, are nevertheless depicted with a vividness and intensity sufficient to create a temporary belief in their reality. Such illusions are now generally held to result from an over-excited brain, a strong imagination, or some bodily malady.

In perfect health the mind not only possesses a control over its powers, but the impressions of the external objects alone occupy its attention, and the play of imagination is consequently checked, except in sleep, when its operations are relatively more feeble and faint.

But in an unhealthy state of the mind, when its attention is partly withdrawn from the contemplation of external objects, the impressions of its own creation, or rather reproduction, will either overpower or combine themselves with the impressions of external objects, and thus generate illusions which in the one case appear alone, while in the other they are seen projected among those external objects to which the eye-ball is directed. This theory explains satisfactorily a large majority of the stories of apparitions; still there are some which it seems insufficient to account for.—*See* CRYSTAL GAZING, HYPNOTISM.

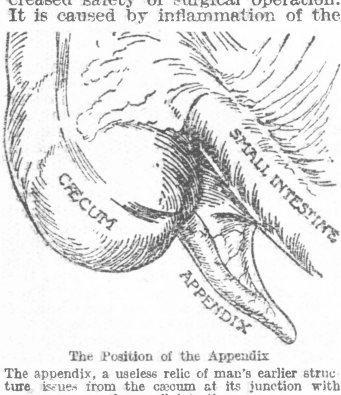
**APPEAL.** In legal phraseology, the removal of a cause from an inferior tribunal to a superior in order that the latter may reverse or amend the decision of the former. The supreme court of appeal for Great Britain is the House of Lords, which may hear appeals from the Courts of Appeal in England and Northern Ireland, from the Courts of Criminal Appeal (by certificate of the Attorney-General), and from the Court of Session in Scotland. From the decisions of certain courts in India, the Dominions (including the Irish Free State), the Colonies, and the Channel Islands appeals may be made to the King in Council and are heard by the Judicial Committee of the Privy Council.

In England the Court of Appeal hears appeals from the Chancery, King's Bench, and Probate, Divorce, and Admiralty Divisions of the High Court of Justice, and also in certain instances (e.g. Workmen's Compensation cases) from the County Courts. Before a Divisional Court of the High

Court appeals are heard from the County Courts, from Quarter Sessions and the Police Courts. From convictions in Police Courts in criminal cases an appeal may be made to Quarter Sessions, and for trials at Assizes and Quarters Sessions of indictable offences appeals are made to the Court of Criminal Appeal, which is composed of three or more of the judges of the High Court who have not tried the case.

**APPEARANCE.** In English law, is the first formal act by which a defendant against whom a writ has been issued submits himself to the jurisdiction of the Court. It consists usually in lodging in the central office a document containing the name of the defendant's solicitor and an address for service of proceedings. Failure to appear within the prescribed time may result in judgment being given against the defendant in his absence—judgment for default of appearance. But such a judgment may be set aside by the Court on terms, e.g. on payment of the costs incurred by the plaintiff. A person who has been personally served as a partner in a firm with a writ against the firm, but who denies that he is in fact a partner, may enter an appearance under protest.

**APPENDICITIS.** A disease which has become well known in recent times through the more accurate methods of diagnosis and the increased safety of surgical operation. It is caused by inflammation of the




The Position of the Appendix

The appendix, a useless relic of man's earlier structure, issues from the cæcum at its junction with the small intestine

vermiform appendix, a narrow, hollow, worm-like body from 2 to 4 inches long, opening at one end into the large intestine and forming a cul-de-sac at the other. In appendicitis the inflammation begins in the appendix and frequently spreads to the neighbouring parts, causing inflammation of the cæcum, a condition known as perityphlitis. The most frequent cause of appendicitis is a hard piece of insufficiently-digested food becoming lodged in the appendix. Occasionally orange pips, grape stones, etc., are the cause, though not so often as is popularly supposed.

The symptoms are: abdominal pain (especially low down at the right side), fever, nausea, vomiting, constipation; these varying according to the intensity of the attack. Three types are recognized:

1. A mild type, when the symptoms subside in a few days and the patient soon *appears* to be in normal health.

2. A severe type, in which, if left alone, the appendix bursts into the abdominal cavity and death from general peritonitis results.

3. Another type, in which the inflammation in the appendix leads to the formation of a localized abscess, sometimes of great size.

The treatment for the severe and for the abscess-forming types is essentially immediate operation; while for the mild type operation may either be performed at once or after the attack has passed off. Anyone who has had one attack of appendicitis is liable to have it repeated in a much severer form, hence the advisability of having the appendix removed after the first attack, however slight. During an attack, prior to surgical interference, complete rest in bed is essential. Abdominal pain should be treated with frequent hot fomentations, and the diet should be reduced to small quantities of fluid.

**APPENZELL** (ap'pen-tsel). A Swiss canton, wholly enclosed by the canton of St. Gall; area, 162 sq. miles. It is divided into two independent portions or half-cantons, outer-Rhoden, which is Protestant, and Inner-Rhoden, which is Catholic. It is an elevated district, traversed by branches of the Alps, Mount Säntis in the centre being 8250 feet high. It is watered by the Sitter and by several smaller affluents of the Rhine. Glaciers occupy the higher valleys. Flax, hemp, grain, fruit, etc., are produced, but the wealth of Inner-Rhoden lies in its herds and flocks—that of Outer-Rhoden in its manufactures of embroidered muslins, gauzes, cambrics, and other cotton stuffs; also of silk goods and paper.

The town of Appenzell (Ger. *Abtenzelle*, abbot's cell) is the capital of Inner-Rhoden, on the Sitter, with about 4300 inhabitants. Trogen is the capital of Outer-Rhoden, Herisau the largest town (pop. 11,000). Pop.

Outer-Rhoden, 55,354; Inner-Rhoden, 14,614.

**APPERCEPTION.** *See* METAPHYSICS.

**APPERLEY, Charles James.** English writer known as "Nimrod." Born in Denbighshire about 1778 and educated at Rugby, he began to write on sporting matters, of which he had a wide knowledge, and soon made a reputation. His books include *The Life of John Mytton*, *The Life of a Sportsman* and *Nimrod's Hunting Tours*. He died in London, May 19th, 1843.

**AP'PETITE.** In its widest sense, means the natural desire for gratification, either of the body or the mind; but is generally applied to the recurrent and intermittent desire for food. A healthy appetite is favoured by work, exercise, plain living, and cheerfulness; absence of this feeling, or defective appetite (*anorexia*), indicates diseased action of the stomach, or of the nervous system or circulation, or it may result from vicious habits. Depraved appetite (*pica*), or a desire for unnatural food, as chalk, ashes, dirt, soap, etc., depends often in the case of children on vicious tastes or habits; in grown-up persons it may be symptomatic of dyspepsia, pregnancy or chlorosis. Insatiable or canine appetite or voracity (*bulimia*) when it occurs in childhood is generally symptomatic of worms; in adults common causes are pregnancy, vicious habits, and indigestion caused by stomach complaints or gluttony, when the gnawing pains of disease are mistaken for hunger.

**AP'PIAN.** A Roman historian of the second century after Christ, a native of Alexandria, was governor and manager of the imperial revenues under Hadrian, Trajan, and Antoninus Pius, in Rome. He compiled in Greek a Roman history, from the earliest times to those of Augustus, in twenty-four books, of which only eleven have come down to us. Appian's style is not attractive, but he gives us much valuable information.

**APPIA'NI, Andrea.** A painter, born at Milan in 1754, died in 1817. As a fresco-painter he excelled every contemporary painter in Italy. He displayed his skill particularly in the cupola of Santa Maria di S. Celso at Milan, and in the paintings representing the legend of Cupid and Psyche prepared for the walls and ceiling of the villa of the Archduke Ferdinand at Monza (1795). Napoleon appointed him royal court painter and portraits of almost the whole of the imperial family were painted by him.

**APPIAN WAY,** called *Regina Viarum*, the Queen of Roads. The oldest and most renowned Roman road, was constructed during the censorship of Appius Claudius Cæcus (313-310 B.C.). It was built with large square stones on a raised platform, and was made direct from the gates of Rome to Capua, in Campania. It was afterwards extended through Samnium and Apulia to Brundusium, the modern Brindisi. It was partially restored by Pius VI., and between 1850 and 1853 it was excavated by order of Pius IX. as far as the eleventh milestone from Rome.

**APPIN.** Coastal district of Argyllshire, including Glencoe. The Appin murder, celebrated by R. L. Stevenson in *Kidnapped* and *Catriona*, was a famous case. On May 14th, 1752, Colin Campbell was murdered and Alan Breck Stewart was charged with the crime. He fled to France, but James Stewart, an accomplice, was arrested, sentenced to death and hanged. The real murderer is unknown.

**APPIUS CLAUDIUS,** surnamed *Cæcus*, or the blind. A Roman patrician, elected censor 312 B.C., which office he held four years. While in this position he made every effort to weaken the power of the Plebs, and constructed the road and aqueduct named after him. He was subsequently twice consul, and once dictator. In his old age he became blind, but in 280 B.C. he made a famous speech in which he induced the senate to reject the terms of peace fixed by Pyrrhus. He is the earliest Roman writer of prose and verse whose name we know.

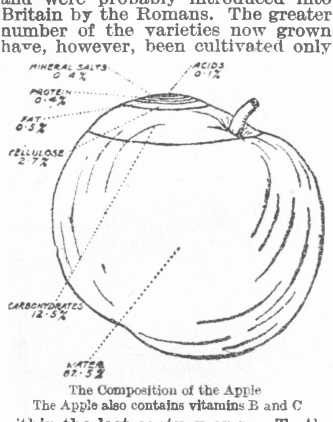
**APPIUS CLAUDIUS CRASSUS.** One of the Roman *decemvirs*, appointed 451 B.C. to draw up a new code of laws. He and his colleagues plotted to retain their power permanently, and at the expiry of their year of office refused to give up their authority. The people were incensed against them, and the following circumstances led to their overthrow.

Appius Claudius had conceived an evil passion for Virginia, the daughter of Lucius Virginius, then absent with the army in the war with the Æqui and Sabines. At the instigation of Appius, Marcus Claudius, one of his clients, claimed Virginia as the daughter of one of his own female slaves, and the *decemvir*, acting as judge, decided that in the meantime she should remain in the custody of the claimant. Virginius, hastily summoned from the army, appeared with his daughter next day in the forum, and appealed to the people; but Appius Claudius again adjudged her

to Marcus Claudius. Unable to rescue his daughter, the unhappy father stabbed her to the heart. The *decemvirs* were deposed by the indignant people 449 B.C., and Appius Claudius died in prison or was strangled.

**APPLE** (*Pyrus Malus*). The fruit of a well-known tree of the nat. ord. Rosaceæ, or the tree itself. The apple belongs to the temperate regions of the globe, over which it is almost universally spread and cultivated. The tree attains a moderate height, with spreading branches; the leaf is ovate; and the flowers are produced from the wood of the former year; but more generally from very short shoots or spurs from wood of two years' growth. The original of all the varieties of the clutivated apple is the wild crab, which has a small and extremely sour fruit, and is a native of most of the countries of Europe.

Apples have been used as food and cultivated for upwards of 4000 years, and were probably introduced into Britain by the Romans. The greater number of the varieties now grown have, however, been cultivated only




The Composition of the Apple
The Apple also contains vitamins B and C

within the last century or so. To the facility of multiplying varieties by grafting is to be ascribed the amazing extension of the sorts of apples, the number of varieties known being over 2000.

Many of the more marked varieties are known by general names, as pippins, codlins, rennets, etc. The oldest apple in cultivation is a variety called "the lady," which originated in Britain early in the seventeenth century. Apples for the table are characterized by a firm juicy pulp, a sweetish acid flavour, regular form, and beautiful colouring; those for cooking by the property of forming by the aid of heat into a pulpy mass of equal consistency, as also by their large size and keeping properties; apples for cider must have a considerable degree of astringency, with richness of juice.

The propagation of apple trees is accomplished by seeds, cuttings, suckers, layers, budding, or grafting, the last being almost the universal practice. The tree thrives best in an open situation where it will receive the maximum amount of sunshine and protection from cold winds. The protection is particularly necessary in districts where cold winds and frosts prevail during the flowering season. The wood of the apple tree or the common crab is hard, close-grained, and often richly coloured, and is suitable for turning and cabinet work. The fermented juice (*verjuice*) of the crab is employed in cookery and medicine. Apples are largely imported into Great Britain from Canada, the United States, Australia, and South Africa. The designation apple, with various modifying words, is applied to a number of fruits having nothing in common with the apple proper, as alligator-apple, love-apple, etc.—Cf. A. E. Wilkinson, *The Apple*.

**AP'PLEBY.** County town of Westmorland, England, on the Eden, 28 miles S.S.E. of Carlisle. Disfranchised in 1832, it gave its name to a parliamentary division of the county until 1918. It has an old castle, the keep of which, called Cæsar's Tower, is still fairly well preserved. Pop. (1931), 1618.

**APPLE OF DISCORD.** According to the story in Greek mythology, the golden apple thrown into an assembly of the gods by the goddess of discord (Eris) bearing the inscription "for the fairest." Aphroditē Venus), Hera (Juno), and Athēnē (Minerva) became competitors for it, and its adjudication to the first by Paris so inflamed the jealousy and hatred of Hera to all of the Trojan race (to which Paris belonged) that she did not cease her machinations till Troy was destroyed.

**APPLE OF SODOM.** A fruit described by old writers as externally of fair appearance, but turning to ashes when plucked; probably the fruit of *Solānum sodomēum*.

**AP'PLETON.** A city of Wisconsin, United States, 100 miles N.W. of Milwaukee by rail. It has many flour, paper, and woollen mills, and other manufactories, and is the seat of the collegiate institute and of the Lawrence University. Pop. (1920), 19,561.

**APPLIQUÉ.** In needlework or metal-work, a design or feature having the appearance of being independently made and attached to the surface of the object it adorns. When

the ornament is sunk into the body of the object it is called *inlay*.

**APPOGGIATURA** (ăp-poj-ă-tö'-râ). In music, a small additional note of embellishment preceding the note to which it is attached, and taking away from the principal note a portion of its time.

**APPOINT'MENT.** A term in English law signifying the exercise of some power, reserved in a conveyance or settlement of burdening, selling, or otherwise disposing of the lands or property conveyed. Such a reserved power is termed a *power of appointment*.

**APPOMATT'OX COURT-HOUSE.** A village in Virginia, United States, 20 miles E. of Lynchburg. Here, on 9th April 1865, General Lee surrendered to General Grant, and thus virtually concluded the American Civil War.

**APPONYI, Albert, Count.** Hungarian statesman, born in 1846. Leader of the Conservative National party, he joined the Liberal party in 1899, and in 1901 was elected President of the Chamber of Deputies. He was Minister of Education in 1906 and 1917, and again in 1918. In 1920 he was at the head of the Hungarian delegation in Paris. At the 1924 and 1925 Assemblies of the League of Nations he represented Hungary. He died in 1933.

**APPOSI'TION.** In grammar, the relation in which one or more nouns or substantive phrases or clauses stand to a noun or pronoun, which they explain or characterize without being predicated of it, and with which they agree in case; as Cicero, the *orator*, lived in the first century before Christ; the opinion, *that a severe winter is generally followed by a good summer*, is a vulgar error.

**APPRAI'SER.** A person employed to value property, and duly licensed to do so by licence taken out every year. The valuation must be duly set down in writing, and there is a certain fixed scale of charges for the appraiser's services.

**APPREHEN'SION.** The seizing of a person as a criminal whether taken in the act or on suspicion, and with or without a warrant, a warrant being necessary when the person apprehending is not present at the commission of the offence.

**APPREN'TICE.** One bound by indenture to serve some particular individual or company of individuals for a specified time, in order to be instructed in some art, science, or trade. In England a person under the age of twenty-one cannot bind himself apprentice, and accordingly the usual way is for a relation or friend to become a contracting party to the indenture, and engage for the faithful performance of the agreement. An infant cannot be bound apprentice by his friends without his own expressed consent.

In Scotland a boy under fourteen or a girl under twelve years of age cannot become a party to an indenture without the concurrence of a parent or guardian; above that age they may enter into an indenture of themselves, and thereby become personally bound. An indenture is determinable by the consent of the parties to it, and also by the death, bankruptcy, or retirement from business of the master.

**Parish apprentices** are bound out by the guardians of the poor to suitable persons, and in this case the consent of the apprentice is not necessary. The system of apprenticing by indenture is now much less common than formerly.—Cf. R. A. Bray, *Boy Labour and Apprenticeship*.

**APPROACH'ES.** In field-engineering, an old-fashioned name for what are now called "communication trenches."

**APPROPRIA'TION.** *See* IMPROPRIATION.

**APPRO'VER** (ap-prö'vêr). In English law, any accomplice in a crime who is allowed by the judges of jail-delivery to become king's evidence, that is, to be examined in evidence against his accomplices, it being understood that the approver will himself be pardoned upon making a full and open confession.

**APPROXIMA'TION.** A term used in mathematics to signify a continual approach to a quantity required, when no process is known for arriving at it exactly. Although, by such an approximation, the exact value of a quantity cannot be discovered, yet, in practice, it may be found sufficiently correct; thus the diagonal of a square, whose sides are represented by unity, is $\sqrt{2}$, the exact value of which quantity cannot be obtained; but its approximate value may be substituted in the nicest calculations.

**APPULEIUS.** *See* APULEIUS.

**AP'RICOT** (*Prunus Armeniăca*). A fruit of the plum genus which was introduced into Europe from Asia more than three centuries before Christ, and into England from Italy in 1524. It is a native of Armenia and other parts of Asia and also of Africa. The apricot is a low tree, of rather crooked growth, with somewhat heart-shaped leaves and sessile flowers. The fruit is sweet, more or less juicy, of a

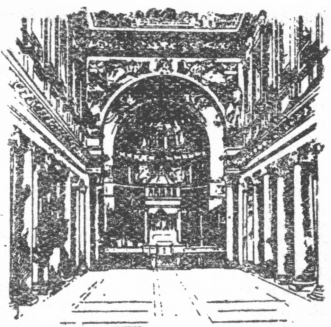
yellowish colour, about the size of a peach, and resembling it in delicacy of flavour. Some of the best varieties are "Frogmore Early," "Moorpark," "Royal," etc. The wood is coarsely grained and soft. Apricot trees are chiefly raised against walls, and are propagated by budding and grafting.

**APRIES** (ā'pri-ēz). Pharaoh-Hophra of Scripture, the eighth king of the twenty-six Egyptian dynasty. He succeeded his father Psammetichus in 590 or 589 B.C. The Jews under Zedekiah revolted against their Babylonian oppressors and allied themselves with Apries, who was, however, unable to raise the siege of Jerusalem, which was taken by Nebuchadnezzar. A still more unfortunate expedition against Cyrene brought about revolt in his army, in endeavouring to suppress which Apries was defeated and slain about 570 B.C.

**A'PRIL** (Lat. *Aprilis*, from *aperire*, to open, because the buds open at this time). The fourth month of the year. The strange custom of making fools on 1st April by sending people upon errands which end in disappointment, and raise a laugh at the expense of the person sent, prevails throughout Europe. It has been connected with the miracle plays of the Middle Ages, in which the Saviour was represented as having been sent, at this period of the year, from Annas to Caiaphas and from Pilate to Herod. This explanation, however, is perhaps itself a piece of April fooling. In France the party fooled is called *un poisson d'avril*, "an April fish"; in Scotland, a "gowk," or cuckoo.

**A PRIO'RI** ("from what goes before"). A phrase applied to a mode of reasoning by which we proceed from general principles or notions to particular cases, as opposed to *a posteriori* ("from what comes after") reasoning, by which we proceed from knowledge previously acquired. Mathematical proofs are of the *a priori* kind; the conclusions of experimental science are *a posteriori*. It is also a term applied to knowledge independent of all experience.

**APSE.** A portion of any building forming a termination or projection semi-circular or polygonal in plan, and having a roof forming externally a semi-dome or semi-cone, or having ridges corresponding to the angles of the polygon; especially such a semi-circular or polygonal recess projecting from the east end of the choir or chancel of a church, in which the altar is placed. The apse was developed from the somewhat similar part

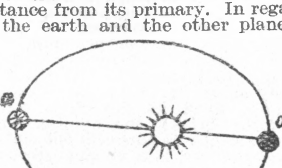


Apse—Church of Sta Maria in Trastevere, Rome

of the Roman basilicæ, in which the magistrate (*prætor*) sat.

**AP'SHERON.** A peninsula on the western shore of the Caspian Sea formed by the eastern extremity of the Caucasus Mountains. It extends for about 40 miles, and terminates in Cape Apsheron. It yields immense quantities of petroleum. *See* BAKU.

**APSIS,** pl. **AP'SIDES** or **APSI'DES.** In astronomy, one of the two points of the orbit of a heavenly body situated at the extremities of the major axis of the ellipse formed by the orbit, one of the points being that at which the body is at its greatest and the other that at which it is at its least distance from its primary. In regard to the earth and the other planets,




*aa*, Apsides

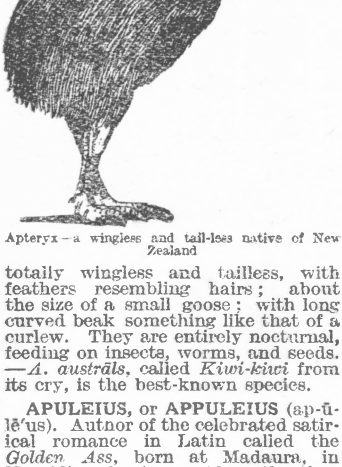
these two points are called the aphelion and perihelion; and in regard to the moon they are called the apogee and perigee. The line of the apsides has a slow forward angular motion in the plane of the planet's orbit, being retrograde only in the case of Venus. This in the earth's orbit produces the anomalistic year. *See* ANOMALY.

**APT** (ät; ancient **APTA JULIA**). A town of Southern France, department Vaucluse, 32 miles east by south of Avignon, with an ancient Gothic cathedral. Pop. 6336.

**AP'TERA** (Gr. *apteros*, wingless). Wingless insects, such as lice and cer-

tain others, popularly called *Springtails*, and composed of two groups, Collembola and Thysanura.

**AP'TERYX.** A nearly extinct genus of cursorial birds, distinguished from the ostriches by having three toes with a rudimentary hallux, which forms a spur. They are natives of the South Island of New Zealand; are



Apteryx – a wingless and tail-less native of New Zealand

totally wingless and tailless, with feathers resembling hairs; about the size of a small goose; with long curved beak something like that of a curlew. They are entirely nocturnal, feeding on insects, worms, and seeds. —*A. australis*, called *Kiwi-kiwi* from its cry, is the best-known species.

**APULEIUS,** or **APPULEIUS** (ap-ū-lē'us). Autnor of the celebrated satirical romance in Latin called the *Golden Ass*, born at Madaura, in Numidia, about A.D. 125; the time of his death is unknown. He studied at Carthage, then at Athens, where he became warmly attached to the Platonic philosophy, and finally at Rome. Returning to Carthage he married a rich widow, whose relatives accused him of gaining her consent by magic, and the speech by which he successfully defended himself is still extant. Besides his *Golden Ass* (which is also known as the *Metamorphoses*, and which was translated into English by W. Adlington in 1566), with its fine episode of Cupid and Psyche, he was also the author of many works on philosophy and rhetoric, some of which are still extant.

**APU'LIA.** A department or division in the south-east of Italy, on the Adriatic, composed of the provinces of Foggia, Bari, and Lecce; area, 7376 sq. miles. Pop. 2,344,314.

**APURE** (ä-pö'rā). A navigable river of Venezuela, formed by the junction of several streams which rise in the Andes of Colombia; it falls into the Orinoco.—**Apure,** one of the States of Venezuela, has a pop. of 39,187.

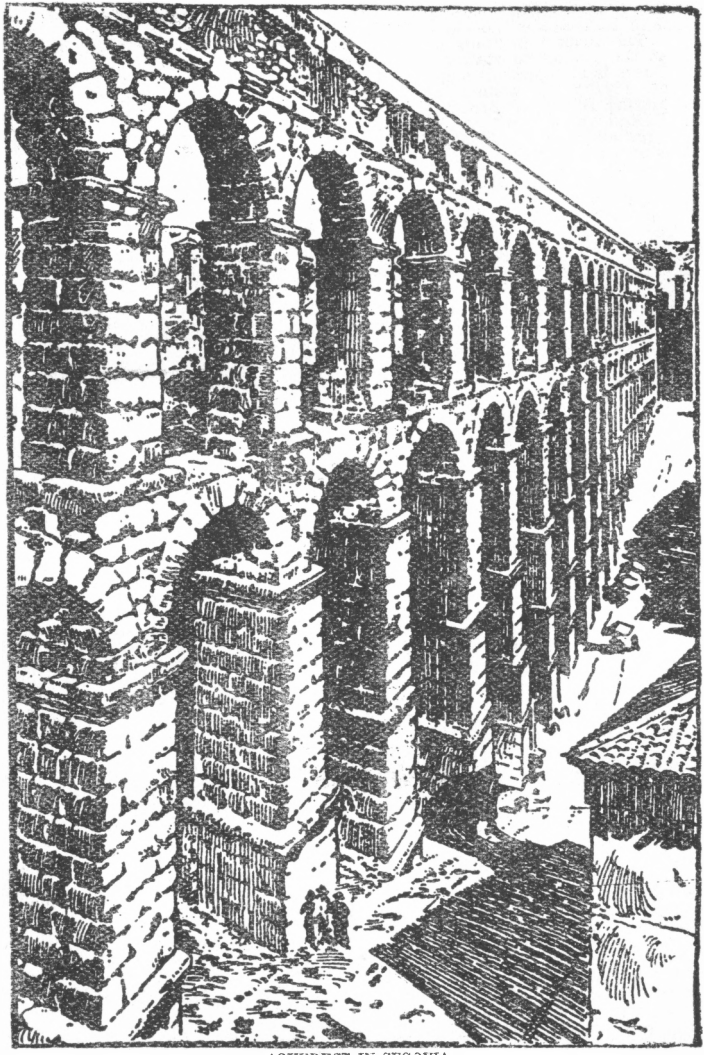
**APURIMAC** (ä-pö-rē-mäk'). A River of South America, which rises in the Andes of Peru, and, being augmented by the Vilcamayu and other streams, forms the Ucayali, one of the principal head-waters of the Amazon. —The department of Apurimac in Peru has an area of 8187 sq. miles, and a pop. of 177,387.

**AQ'UA** (Lat. for water). A word much used in pharmacy and old chemistry.—**Aqua fortis** (= strong water), a weak and impure nitric acid. It has the power of eating into steel and copper, and hence is used by engravers, etchers, etc.—**Aqua marina,** a fine variety of beryl. *See* AQUAMARINE.—**Aqua regia,** or **aqua regalis** (= royal water), a mixture of nitric and hydrochloric acids, with the power of dissolving gold and other precious metals.—**Aqua Tofana,** a poisonous fluid made about the middle of the seventeenth century by an Italian woman Tofana or Toffania, who is said to have procured the death of no fewer than 600 individuals by means of it. It consisted chiefly, it is supposed, of a solution of crystallized arsenic.—**Aqua vitæ** (=water of life), or simply **aqua,** a name familiarly applied to the *whisky* of Scotland, corresponding in meaning with the *usquebaugh* of Ireland, the *eau de vie* (brandy) of the French.

**AQ'UAMARINE.** A name given to some of the finest varieties of beryl of a sea-green or blue colour. Varieties of topaz are also so called.

**AQUA'RIUM.** A vessel or series of vessels constructed wholly or partly of glass and containing salt or fresh water in which are kept living specimens of marine or fresh-water animals along with aquatic plants. In principle the aquarium is based on the interdependence of animal and vegetable life; animals consuming oxygen and exhaling carbonic acid, plants reversing the process by absorbing carbonic acid and giving out oxygen. The aquarium must consequently be stocked both with plants and animals, and for the welfare of both something like a proper proportion should exist between them.

The simplest form of aquarium is that of a glass vase; but aquaria on a larger scale consist of a tank or a number of tanks with plate-glass sides and stone floors, and contain sand and gravel, rocks, sea-weeds, etc. By improved arrangements light is admitted from above, passing through the water in the tanks and illuminat-



AQUEDUCT IN SEGOVIA

ing their contents, while the spectator is in comparative darkness.

The most important aquarium is at the zoological station at Naples. There is also one, on a smaller scale, at Plymouth, maintained by the Marine Biological Association of the United Kingdom. Aquaria on a large scale have been constructed in connection with public parks or gardens, and the name is also given to places of public entertainment in which large aquaria are exhibited.—Cf. G. C. Bateman, *Fresh-water Aquaria*; M. J. Newbigin, *The Aquarium*.

**AQUARIUS** (Lat., the Water-bearer). A sign of the zodiac which the sun enters about the 21st of Jan.; it now enters the formerly coincident constellation Aquarius about a month later.

**AQUATINT.** A method of etching on copper by which a beautiful effect is produced, resembling a fine drawing in sepia or Indian ink. The special character of the effect is the result of sprinkling finely-powdered resin or mastic over the plate, and causing this to adhere by heat, the design being previously etched, or being now traced out. The nitric acid (aqua fortis) acts only in the interstices between the particles of resin or mastic, thus giving a slightly granular appearance.

**AQUA TOFA'NA.** *See* AQUA.

**AQUA VITÆ.** *See* AQUA.

**AQ'UEDUCT** (Lat. *aqua*, water, *duco*, to lead). An artificial channel or conduit for the conveyance of water from one place to another: more particularly applied to structures for conveying water from distant sources for the supply of large cities. Aqueducts were extensively used by the Romans, and many of them still remain in different places on the Continent of Europe, some being still in use.

The Pont du Gard in the south of France, 14 miles from Nimes, is still nearly perfect, and is a grand monument of the Roman occupation of this country. The ancient aqueducts were constructed of stone or brick, sometimes tunnelled through hills, and carried over valleys and rivers on arches. The Pont du Gard spans the River Gard, and was built to convey to Nimes the water of springs rising in the neighbourhood of the modern Uzès. It is built of great blocks of stone; its height is 160 feet; length of the highest arcade, 882 feet. The aqueduct at Segovia, originally built by the Romans, has in some parts two tiers of arcades 100 feet high, is 2921 feet in length, and is one of the most admired works of antiquity.

One of the most remarkable aqueducts of modern times is that constructed by Louis XIV. for conveying the waters of the Eure to Versailles. The extensive application of metal pipes has rendered the construction of aqueducts of the old type less necessary; but what may be called aqueduct bridges are still frequently constructed in connection with canals and also with water-works for the supply of towns. Where canals exist canal aqueducts are common, since the water in any section of a canal must be kept on a perfect level.

Many large towns now derive a supply of water from sources at a great distance, and in bringing the water to the place where it is required much tunnelling is often necessary as well as digging and excavating in the open.

A tunnel furnishing a water channel may be driven through miles of rock strata of various kinds, and in many places it may have to be lined with concrete or cement wholly or partially, brickwork also being much employed. Instead of tunnelling, the channel may be formed on the plan of "cut and cover," being first cut in the ground and then covered over, leaving the surface much in the same state as before. And, of course, iron piping is often used in connection with such tunnels, the water being conveyed so far in an aqueduct of one kind, and so far in one of another kind, according as is deemed most suitable. In the Thirlmere aqueduct, which brings water to Manchester, there are 45 miles of cast-iron pipes, 37 miles of cut-and-cover work, and 14 miles of tunnels proper. Pipes are naturally laid where valleys occur, and the water simply enters the pipes at one end and flows out at the other by the influence of gravity, there being a suitable chamber constructed at either end of the pipe line where there is a junction with a section of tunnel.

Aqueduct bridges were first introduced into England in the eighteenth century, the first being the aqueduct at Barton Bridge conveying the Bridgewater Canal across the Irwell. In such bridges the water-channel may be made of cast iron. There are great aqueduct bridges on some of the Indian canals, such as the Nadrai bridge on the Lower Ganges Canal. In America water is often carried long distances in *flumes* or open wooden channels, supported, where necessary, on trestles. Great wooden pipes are also common there, built of large staves and hooped round with iron or steel. These often rest on the surface

of the ground without any covering.—BIBLIOGRAPHY: C. Herschel, *Frontinus*; Wegmann, *Water-supply of City of New York*; J. F. Bateman, *The Manchester Waterworks*; J. M. Gale, *The Glasgow Waterworks*; A. Prescott Folwell, *Water Supply Engineering*.

**AQUEOUS HUMOUR.** The limpid watery fluid which fills the space between the cornea and the crystalline lens in the eye.

**AQUEOUS ROCKS.** Composed of matter deposited by water from suspension or solution. Called also *sedimentary rocks*. *See* GEOLOGY.

**AQUIFOLIA'CEÆ.** A nat. ord. of plants; the holly tribe. The species consist of trees and shrubs, and the order includes the common holly (*Ilex Aquifolium*) and the *I. paraguayensis*, or Paraguayan tea tree.

**AQUILA** (ák'wē-lá). A town in Italy, capital of the province of Aquila, 55 miles north-east of Rome, the seat of a bishop, an attractive and interesting town with spacious streets and handsome palaces. In 1703 and 1706 it suffered severely from earthquakes. Pop. 23,779.—The province has an area of 2493 sq. miles. Pop. 397,509.

**AQ'UILA.** A companion of St. Paul (Acts xviii. 2, 3). Expelled from Rome, he and his wife, Priscilla, settled in Corinth, where Paul stayed with them. They were converted to Christianity by the Apostle.

**AQ'UILA.** A native of Pontus, flourished about A.D. 130. He became a Jewish proselyte, and made a close and accurate translation of the Hebrew Scriptures into Greek, extant only in fragments.

**AQ'UILA.** Name of a constellation in the northern hemisphere. *See* CONSTELLATIONS.

**AQUILA'RIA.** *See* ALOES-WOOD.

**AQUILE'GIA.** *See* COLUMBINE.

**AQUILEIA** (ak-wi-lē'ya). An ancient city near the head of the Adriatic Sea, in Upper Italy, built by the Romans in 182 or 181 B.C. Commanding the N.E. entrance into Italy, it became important as a commercial centre and a military post, and was frequently the base of imperial campaigns. In 425 it was destroyed by Attila. The modern Aquileia or Aglar is a small place of some 1700 inhabitants, consisting chiefly of fishermen.

**AQUINAS** (a-kwī'nas; i.e. of Aquino), **St. Thomas.** A celebrated scholastic divine, born in 1225 or 1227, most probably at the castle of Rocco Secca, near Aquino. His father was Count of Aquino, in the kingdom of Naples. He was educated at the Benedictine monastery of Monte Casino, and at the University of Naples, where he studied for six years. About the age of seventeen he entered a convent of Dominicans, much against the wishes of his family. He attended the lectures of Albertus Magnus at Cologne, in whose company he visited Paris in 1245 or 1246. Here he became involved in the dispute between the university and the Begging Friars as to the liberty of teaching, advocating the rights claimed by the latter with great energy.

In 1257 he received the degree of doctor from the Sorbonne, and began to lecture on theology, rapidly acquiring the highest reputation. In 1263 he is found at the Chapter of the Dominicans in London. In 1268 he was in Italy, lecturing in Rome, Bologna, and elsewhere. In 1271 he was again in Paris lecturing to the students; in 1272 he was professor at Naples. In 1263 he had been offered the archbishopric of Naples by Clement IV., but refused the offer. He died, in 1274, on his way to Lyons to attend a general council for the purpose of uniting the Greek and Latin Churches. He was called, after the fashion of the times, the *angelic doctor*, and was canonized by John XXII.

The most important of his numerous works, which are all written in Latin, are the *Summa Theologica*, which, although only professing to treat of theology, is in reality a complete and systematic summary of the knowledge of the time, and the *Summa Philosophica*. The work of St. Thomas consisted in an effort to harmonize the new scientific teachings of the age—derived from Arabian and Byzantine sources—with the doctrine of the Church, and to refute heresy. His disciples were known as *Thomists*.—Cf. P. Conway, *St. Thomas Aquinas*; and article in *Hastings' Encyclopedia of Religion and Ethics*.

**AQUITA'NIA,** later **AQUITAINE.** A Roman province in Gaul, which comprehended the countries on the coast from the Garonne to the Pyrenees, and from the sea to Toulouse. It was brought into connection with England by the marriage of Henry II. with Eleanor, daughter of the last Duke of Aquitaine. The title to the province was for long disputed by England and France, but it was finally secured by the latter (1453).

**ARABAH'.** A deep rocky valley or depression in north-western Arabia between the Dead Sea and Gulf of

Akabah, a sort of continuation of the Jordan valley.

**ARABESQUE** (ar'a-besk). A species of ornamentation for enriching flat surfaces, often consisting of fanciful figures, human or animal, combined with floral forms. There may be said to be three periods and distinctive varieties of arabesque— (*a*) the Roman or Græco-Roman, introduced into Rome from the East when pure art was declining; (*b*) the Arabesque of the Moors as seen in the Alhambra, introduced by them into Europe in the Middle Ages; (*c*) Modern Arabesque, which took its rise in Italy in the Renaissance period of art. The arabesques of the Moors, who are prohibited by their religion from representing animal forms, consist essentially of complicated ornamental designs based on the suggestion of plant-growth, combined with extremely complex geometrical forms.

**ARABGIR** (å-råb-gēr'), or **ARABKIR'**. A town in Asia, 147 miles W.S.W. of Erzerum, noted for its manufacture of silk and cotton goods. Pop. between 20,000 and 30,000.

**ARA'BIA.** A vast peninsula in the S.W. of Asia, bounded on the N. by the great Syro-Babylonian plain, N.E. by the Persian Gulf and the Sea of Oman, S. or S.E. by the Indian Ocean, and S.W. by the Red Sea and Gulf of Suez. Its length from N.W. to S.E. is about 1800 miles, its mean breadth about 800 miles, its area approximately 1,200,000 sq. miles, its population probably about 5,000,000.

**General Features.** Roughly described, it exhibits a central tableland surrounded by a series of deserts, with numerous scattered oases, while around this is a line of mountains parallel to and approaching the coasts, and with a narrow rim of low grounds (*tehāma*) between them and the sea. In its general features Arabia resembles the Sahara, of which it may be considered a continuation. Like the Sahara, it has its wastes of loose sand, its stretches of bare rocks and stones, its mountains devoid of vegetation, its oases with their wells and streams, their palm-groves and cultivated fields—islands of green amidst the surrounding desolation.

The deserts, the Great Nefud, the Little Nefud, and the Ruba el Khali, are for the most part uninhabitable, though in places affected by the winter rains there is good spring pasture. There are no rivers, but there are innumerable wadis or channels down which the water rushes during the rains. By the ancients the whole peninsula was broadly divided into three great sections—Arabia Petræa (containing the city Petra), Deserta (desert), and Felix (happy). The first and last of these answer roughly to the modern divisions of the region of Sinai in the N.W. and Yemen in the S.W., while the name *Deserta* was vaguely given to the rest of the country. (*See* EXPLORATIONS, MODERN).

The oases in Central Arabia and the fertile coastal plains provide the only support for settled communities, which are to be found in eight separate divisions. Each of the two great oases of Central Arabia formed, till 1921, an Emirate, that of Nejd and Hasa (capital, Riyadh) dominating, to a certain extent, the other, Jebel Shammar (capital, Hail). In 1921, however, Ibn Saud, Sultan of Nejd, annexed Jebel Shammar (*see* NEJD). The coastal states are the Kingdom of Hejaz (now held by Ibn Saud—*see* HEJAZ), including Mecca and Medina, the Principate of Asir (capital, Sabijah), the Imamate of Yemen, the Sultanate of Oman, and the Sultanate of Koweit.

In the extreme south-west corner is the protectorate of Aden, which, with the islands of Kamaran and Perim in the Red Sea, the Kuria Muria Islands in the Arabian Sea, and the Bahrein Islands in the Persian Gulf, belongs to Britain. There are, in addition, the following dependent or protected states: The Emirate of Kerak or Transjordan; the Emirate of Bab-el-Mandeb, lying south of Yemen; the Emirate of Lahj, near Aden; the State of Hadhramaut, situated north of the British protected area between Aden and Oman; the Emirate of El-Mohammerah or Karun, near Basra; and the Emirate of Bahrein.

**Climate and Productions.** The climate of Arabia in general is marked by extreme heat and dryness. Aridity and barrenness characterize both high and low grounds, and the date-palm is often the only representative of vegetable existence. There are districts which in the course of the year are hardly refreshed by a single shower of rain. Forests there are few or none. Grassy pastures have their place supplied by steppe-like tracts, which are covered for a short season with aromatic herbs, serving as food for cattle. The date-palm furnishes the staple article of food; the cereals are wheat, barley, maize, and millet; various sorts of fruit flourish; coffee and many aromatic plants and substances, such as gum-arabic, benzoin, mastic, balsam, aloes, myrrh, frankincense, etc. are produced. There are also cultivated in different parts of the peninsula, according to the soil and climate, beans, rice, lentils, to-

bacco, melons, saffron, colocynth, poppies, olives, etc.

**Animals and Minerals.** Sheep, goats, oxen, the horse, the camel, ass, and mule supply man's domestic and personal wants. Among wild animals are gazelles, ostriches, the lion, panther, hyena, jackal, etc. Among mineral products are saltpetre, mineral pitch, petroleum, salt, sulphur, and several precious stones, as the carnelian, agate, and onyx.

**People.** The people of Arabia, according to their own traditions, are derived from two stocks, the pure Arabs and the naturalized Arabs or Mustarab. They are leading either a settled agricultural life or a nomadic existence. In Southern Arabia the Jews form a large element in the towns' population. Commerce is largely in the hands of foreigners, among whom the Jews and Banians (Indian merchants) are the most numerous.

**Ports and Trade.** The coast-line is remarkably free from indentation, and consequently the harbours are mostly little better than open roadsteads, though the port accommodation at Jidda, Perim, Aden, and Muscat is safe and good. Of the other ports Hodeida, the outlet of Yemen, Umlejh, Loheia, and Mocha on the Red Sea, and Koweit and Dibai on the Gulf are capable of development. There is a large dhow trade with India and Africa, and Arabia has a huge transhipment export. Jidda has a big pilgrim trade. The principal exports are hides, skins, coffee, gums, wax shells, and salt. In the Bahrein Islands pearls are important, the annual value of those exported being over £1,000,000.

**History.** The history of Arabia previous to Mahomet is obscure. The earliest inhabitants are believed to have been of the Semitic race. Jews in great numbers migrated into Arabia after the destruction of Jerusalem, and, making numerous proselytes, indirectly favoured the introduction of the doctrines of Mahomet. With his advent the Arabians revolted and united for the purpose of extending the new creed; and under the caliphs—the successors of Mahomet—they attained great power, and founded large and powerful kingdoms in three continents. (*See* CALIPHS).

On the fall of the caliphate of Bagdad in 1258 the decline set in, and on the expulsion of the Moors from Spain the foreign rule of the Arabs came to an end. In the sixteenth century Turkey subdued Hejaz and Yemen, and received the nominal submission of the tribes inhabiting the rest of Arabia. The allegiance of Hejaz was renounced early in the European War; but Yemen achieved its independence in the seventeenth century, and maintained it till 1871, when the territory again fell into the hands of the Turks. In 1839 Aden was occupied by the British. Oman early became virtually independent of the caliphs, and grew into a well-organized kingdom. In 1507 its capital, Maskat or Muscat, was occupied by the Portuguese, who were not driven out till 1659.

The Wahabis appeared towards the end of the eighteenth century, and took an important part in the political affairs of Arabia, but their progress was interrupted by Mohammed Ali, pasha of Egypt, and they suffered a complete defeat by Ibrahim Pasha. He extended his power over most of the country, but the events of 1840 in Syria compelled him to renounce all claims to Arabia. The Hejaz thus again became subject to Turkish sway, and until 1914 Turkey continually extended its rule not only over Yemen, but also over the district of El-Hasa on the Persian Gulf. On 9th June, 1916, the Grand Shereef of Mecca declared himself independent of the Turkish Government, and an Arab revolt spread rapidly. The Grand Shereef Hussein then announced to the Moslem world that the Shereefate of Mecca was henceforth independent, and on 4th Nov., 1916, he had himself formally proclaimed King, or Sultan, of Arabia. The status of the whole of Arabia was determined by the Peace Conference. For subsequent history it is most important to see articles on *Hejaz* and *Nejd*.—BIBLIOGRAPHY: Sir R. F. Burton, *Pilgrimage to Medina and Mecca*; C. M. Doughty, *Arabia Deserta*, and *Wanderings in Arabia*; G. W. Bury, *Arabia Infelix*.

**Arabian Language and Literature.** The Arabic language belongs to the Semitic dialects, among which it is distinguished for its richness, softness, and high degree of development. By the spread of Islam it became the sole written language and the prevailing speech in all South-Western Asia and Eastern and Northern Africa, and for a time in Southern Spain, in Malta, and in Sicily; and it is still used as a learned and sacred language wherever Islam is spread. Almost a third part of the Persian vocabulary consists of Arabic words, and there is the same proportion of Arabic in Turkish. The Arabic language is written in an alphabet of its own, which has also been adopted in writing Persian, Hindustani, Turkish, etc. The vowels are usually omitted in Arabic manuscripts, only the consonants being written.

Poetry among the Arabs had a very early development, and before the time of Mahomet poetical contests were held and prizes awarded for the best pieces. The collection called the *Moallakât* contains seven pre-Mahommedan poems by seven authors. Many other poems belonging to the time before Mahomet, some of equal age with those of the *Moallakât*, are also preserved in collections. Mahomet gave a new direction to Arab literature. The rules of faith and life which he laid down were collected by Abu-Bekr, first caliph after his death, and published by Othman, the third caliph, and constitute the *Koran*—the Mahommedan Bible.

The progress of the Arabs in literature, the arts and sciences, may be said to have begun with the government of the caliphs of the family of the Abbassides, A.D. 749, at Bagdad, several of whom, as Harun al Rashid and Al Mamun, were munificent patrons of learning; and their example was followed by the Ommiades in Spain. In Spain were established numerous academies and schools which were visited by students from other European countries; and important works were written on geography, history, philosophy, medicine, physics, mathematics, arithmetic, geometry, and astronomy. Most of the geography in the Middle Ages is the work of the Arabs, and their historians since the eighth century have been very numerous.

**Philosophy and Learning.** The philosophy of the Arabs was of Greek origin, and derived principally from that of Aristotle. Numerous translations of the scientific works of Aristotle and other Greek philosophers were made, principally by Christian scholars who resided as physcians at the Courts of the caliphs. These were diligently studied in Bagdad, Damascus, and Cordova, and, being translated into Latin, became known in the west of Europe. Of their philosophical authors the most celebrated are Alfarabi (tenth century), Ibn Sina or Avicenna (died A.D. 1037), Alghazzali (died 1111), Ibn Roshd or Averroes (twelfth century), called by pre-eminence The Commentator, etc.

In medicine they excelled all other nations in the Middle Ages, and they are commonly regarded as the earliest experimenters in chemistry. Their mathematics and astronomy were based on the works of Greek writers, but the former they enriched, simplified, and extended. It was by them that algebra was introduced to the Western peoples, and the Arabic numerals were similarly introduced.

Astronomy they especially cultivated, for which famous schools and observatories were erected at Bagdad and Cordova. The *Almagest* of Ptolemy in an Arabic translation was early a textbook among them. Alongside of science poetry continued to be cultivated, but after the ninth or tenth centuries it grew more and more artificial.

Among poets were Abu Nowas, Asmai, Abu Temmam, Motenabbi, Abul-Ala, Busiri, Tograi, and Hariri. Tales and romances in prose and verse were written. The tales of fairies, genii, enchanters, and sorcerers in particular passed from the Arabians to the Western nations, as in *The Thousand and One Nights*. Some of the books most widely read in the Middle Ages, such as *The Seven Wise Masters*, the *Fables of Pilpay* (or Bidpai), and the *Romance of Antar* found their way into Europe through the instrumentality of the Arabs. At the present day Arabic literature is almost confined to the production of commentaries and scholia, discussions on points of dogma and jurisprudence, and grammatical works on the classical language. There are a few newspapers published in Arabic.—BIBLIOGRAPHY: C. Huart, *History of Arabic Literature*; R. A. Nicholson, *Literary History of the Arabs*.

**ARABIAN ARCHITECTURE.** *See* MOORISH ARCHITECTURE, SARACENIC ARCHITECTURE.

**ARABIAN GULF.** *See* RED SEA.

**ARABIAN NIGHTS,** or **THE THOUSAND AND ONE NIGHTS** (Ar. Alf Layla wa-Layla). A celebrated collection of Eastern tales, based upon an old work, called *Hazar Afsana*, long current in the East, and supposed to have been derived by the Arabians from India, through the medium of Persia. They were first introduced into Europe in the beginning of the eighteenth century by means of the French translation of Antoine Galland. Of some of them no original MS. is known to exist; they were taken down by Galland from the oral communication of a Syrian friend.

**Story.** The story which connects the tales of *The Thousand and One Nights* is as follows: The Sultan Shahriyar, exasperated by the faithlessness of his bride, made a law that every one of his future wives should be put to death the morning after marriage. At length one of them, Sheherazade, the generous daughter of the grand-vizier, succeeded in abolishing the cruel custom. By the charm of her stories the fair narrator induced the sultan to defer her execution every day till the dawn of another, by breaking off in the middle of an interesting tale which she had begun to relate.

In the form we possess them these tales belong to a comparatively late period, though the exact date of their composition is not known. Lane, who published a translation of a number of the tales, with valuable notes, is of opinion that they took their present form some time between 1475 and 1525. Sir Richard Burton's complete English translation was issued in 16 vols. (1885-8).

**ARABIAN SEA.** The part of the Indian Ocean between Arabia and India.

**ARABIC FIGURES.** The characters 1, 2, 3, 4, 5, 6, 7, 8, 9. 0; of Indian origin, introduced into Europe by the Moors. They did not come into general use till after the invention of printing.

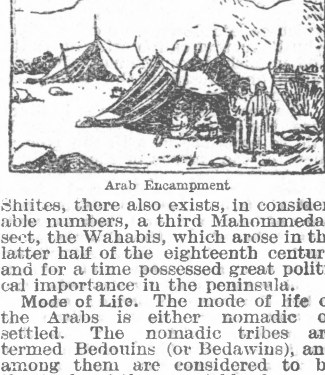
**ARA'BI PASHA.** Egyptian soldier and revolutionary leader, born 1839. In Sept., 1881, he headed a military revolt, and was for a time virtually dictator of Egypt. Britain interfered, and after a short campaign, beginning with the bombardment of Alexandria and ending with the defeat of Arabi at Tel-el-Kebir, he surrendered, and was banished to Ceylon, being pardoned in 1900. He died in obscurity in Cairo in 1911.

**ARABIS.** Genus of flowering plants also called rock cress. It bears white or purple flowers and is a favourite plant for borders. The chief varieties, the double white and single flowering arabis, thrive in a light soil and can be planted at any time from pots in spring or autumn.

**ARABLE LAND.** Land which is fit for ploughing, and capable of being cultivated, as distinguished from grass-land, wood-land, common pasture, mountains, forests, morasses, and waste. In Government returns the term is applied to land that is actually under regular cultivation. The land capable of being cultivated amounts in England and Wales to about 25 per cent., and in Ireland to about 13 per cent. In the course of the last thirty or forty years there has, however, been a considerable diminution in the area of land actually cultivated, as a result of large foreign imports of grain and other agricultural products.

**ARABS.** The Arabs, as a race, are of middle stature, of a powerful though slender build, and have a skin of a more or less brownish colour; in towns and the uplands often almost white. Their features are well cut, the nose straight, the forehead high. They are naturally active, intelligent, and courteous; and their character is marked by temperance, bravery, and hospitality.

**Religion.** The first religion of the Arabs, the worship of the stars, was supplanted by the doctrines of Mahommedanism, which succeeded rapidly in establishing itself throughout Arabia. Besides the two principal sects of Islam, the Sunnites and the



Arab Encampment

Shiites, there also exists, in considerable numbers, a third Mahommedan sect, the Wahabis, which arose in the latter half of the eighteenth century and for a time possessed great political importance in the peninsula.

**Mode of Life.** The mode of life of the Arabs is either nomadic or settled. The nomadic tribes are termed Bedouins (or Bedawins), and among them are considered to be the Arabs of the purest blood.

**ARACACHA,** or **ARRACACHA** (ar-a-kä'cha). A genus of umbelliferous plants of Southern and Central America. The root of *A. esculenta* is divided into several lobes, each of which is about the size of a large carrot. These are boiled like potatoes and largely eaten in South America.

**ARACAN** (ar-a-kan'). The most northern division of Lower Burmah, on the Bay of Bengal; chief town and seaport Akyab. It was ceded to the English in 1826, as a result of the first Burmese war.

**ARAÇARI** (à-rà-sä'rē). Native name of a genus of brilliant birds (Pteroglossus) closely allied to the toucans, but generally smaller; natives of the warm parts of South America.

**ARACATI** (à-rà-kà-tē'). A Brazilian river-port, State of Ceará, on the River Jaguaribe, about 10 miles from its mouth. Exports hides and cotton. Pop. about 10,000.

**ARA'CEÆ.** A nat. ord. of monocotyledonous plants, mostly tropical, having the genus Arum as the type. Most of the species have tuberous roots abounding in starch, which forms a wholesome food after the acrid juice has been washed out. *See* ARUM, CALADIUM, DUMB-CANE.

**ARACHIS** (ar'a-kis). A genus of leguminous plants much cultivated in warm climates, and esteemed a valuable article of food. The most remarkable feature of the genus is that when the flower falls the stalk supporting the small undeveloped fruit lengthens, and bending towards the ground pushes the fruit into the ground, when it begins to enlarge and ripen. The pod of *A. hypogæa* (popularly called ground, earth, or pea nut) is of a pale-yellow colour, and contains two seeds the size of a hazel-nut, in flavour sweet as almonds, and yielding when pressed an excellent oil.

**ARACHNIDA** (a-rak'ni-da; Gr. *arachnē*, a spider). A class of Arthropoda or higher Annulose animals including the Spiders, Scorpions, Mites, Ticks, etc. They have the body divided into a number of segments or *somites*, some of which have always articulated appendages (limbs, etc.). There is often a pair of nervous ganglia in each somite, although in some forms (as spiders) the nervous system becomes modified and concentrated. They are oviparous and somewhat resemble insects, but they have a united head and thorax, and do not undergo a metamorphosis similar to insects. They respire by trachea, by pulmonary sacs, or by the skin.

**AR'ACK**, or **AR'RACK.** A spirituous liquor manufactured in the East Indies from a great variety of substances. It is often distilled from fermented rice, or it may be distilled from the juice of the coconut and other palms. Pure arack is clear and transparent, of a yellowish or straw colour, and with a peculiar but agreeable taste and smell; it contains at least 52 to 54 per cent of alcohol.

**ARAD** (o'rod). A town of the former kingdom of Hungary, on the Maros, 30 miles north of Temeswar, divided by the river into O (old) Arad and Uj (New) Arad, connected by a bridge; it has a fortress, and is an important railway centre, with a large trade and manufactures. The town is now within the confines of Romania, Uj Arad being called Aradul Neo. Population of Old and New Arad together, 63,166.

**AR'ADUS** (now **RUAD**). An islet about a mile in circumference lying 2 miles off the Syrian coast, 35 miles N. of Tripolis; the site of the Phœnician stronghold Arvad, a city second only to Tyre and Sidon; now occupied by about 3000 people, mainly fishermen.

**ARAFAT', or JEBEL ER RAHMEH** ("Mountain of Mercy"). A hill in Arabia, about 200 feet high, with stone steps reaching to the summit, 15 miles south-east of Mecca; one of the principal objects of pilgrimage among Mahommedans, who say that it was the place where Adam first received his wife Eve after they had been expelled from Paradise and separated from each other 120 years. A sermon delivered on the mount constitutes one great ceremony of the *Hajj* or pilgrimage to Mecca, and entitles the hearer to the name and privileges of a *Hajji* or pilgrim.

**AR'AGO, Dominique François.** A French physicist, born in 1786, died at Paris in 1853. After studying in the Polytechnic School at Paris, he was appointed a secretary of the Bureau des Longitudes. In 1806 he was associated with Biot in completing in Spain the measurements of Delambre and Méchain to obtain an arc of the meridian. Before he got back to France he had been shipwrecked and narrowly escaped being enslaved at Algiers. In 1809 he was elected to the Academy of Sciences and appointed a professor at the Polytechnic School.

**Discoveries.** He distinguished himself by his researches in the polarization of light, galvanism, magnetism, astronomy, etc. His discovery of the magnetic properties of substances devoid of iron, made known to the Academy of Sciences in 1824, procured him the Copley medal of the Royal Society of London in 1825. A further consideration of the same subject led to the equally remarkable discovery of the production of magnetism by electricity.

He took part in the revolution of 1848, and held the office of Minister of War and Marine in the provisional Government. At the *coup d'état* of Dec., 1852, he refused to take the oath to the Government of Louis Napoleon, but the oath was not pressed. His works, which were posthumously collected and published, consist, besides his *Astronomie Populaire*, chiefly of contributions to learned societies, and biographical notices (*éloges*) of deceased members of the Academy of Sciences.

**ARAGO, Emmanuel.** Son of Dominique François, French advocate and politician, was born at Paris in 1812; called to the bar 1837; took part in the revolution of 1848; renounced politics after the *coup d'état* of Dec., 1852, but continued to practise at the bar. After the fall of the Empire he again took a prominent part in public affairs, and held several important offices. He is author of a volume of poems and many theatrical pieces. He died in 1896.

**ARAGO, Étienne.** Brother of

Dominique Arago, born 1802, died 1892. He founded the journals *La Réforme* and *Le Figaro*; was director of the Théâtre du Vaudeville, 1829; took part in the revolution of 1848; was condemned to transportation, 1848; fled from France, but returned in 1859; was mayor of Paris during the Franco-Prussian war, and appointed archivist to the École des Beaux Arts, 1878. He was author of upwards of 100 dramas, *La Vie de Molière*, *Les Bleus et les Blancs*, and other works.

**ARAGON', Kingdom of.** A former province or kingdom of Spain, now divided into three provinces of Teruel, Huesca, and Saragossa; bounded on the N. by the Pyrenees, N.W. by Navarre, W. by Castile, S. by Valencia, and E. by Catalonia; length about 190 miles, average breadth 90 miles; area, 18,298 sq. miles. It was governed by its own monarchs until the union with Castile on the marriage of Ferdinand and Isabella (1469).

**ARAGO'NA.** A town in Sicily, 8 miles N.N.E. of Girgenti. Pop. 16,000. In the neighbourhood is the mud volcano of Macculuba.

**ARAGONITE.** A mineral formed of calcium carbonate crystallized in the rhombic system; specific gravity 2.94 (compare *Calcite*). Aragonite passes into calcite in the course of geological time, but is important as the mineral precipitated to form the oolitic limestones of warm seas, and from being the material of most molluscan shells. It was first found in Aragon.

**ARAGUAYA** (ä-rä-gwī'ä). A Brazilian river, principal affluent of the Tocantins; rises about the 18th degree of S. lat.; in its course northwards forms the boundary between the two States of Matto Grosso and Goyaz, and falls into the Tocantins near lat. 6° S.; length, about 1300 miles, of which over 1000 are navigable.

**A'RAL.** A salt-water lake in Asia, in Russian territory, about 150 miles W. of the Caspian Sea, between 43° 12′ and 46° 44′ N. lat., and 58° 18′ and 61° 46′ E. long.; length 270 miles, breadth 165; area, 26,650 sq. miles (or not much smaller than Scotland). It stands 240 feet above the level of the Caspian, and 160 feet above the Mediterranean. It receives the Amu Darya or Oxus and the Syr Darya or Jaxartes, and contains a multitude of sturgeon and other fish. It is encircled by desert sandy tracts, and its shores are without harbours. It has no outlet. The Aral contains a large number of small islands; steamers have been placed on it by the Russians.

**ARA'LIA.** A genus of plants with small flowers arranged in umbels and succulent berries, the type of the nat. ord. Araliaceæ, which is nearly related to the Umbelliferæ, but the species are of a more shrubby habit. They are natives chiefly of tropical or subtropical countries, and in Britain are represented by the ivy; ginseng belongs to the order. From the pith of *A. papyrifera* is obtained the Chinese rice-paper.

**A'RAM, Eugene.** A self-taught scholar whose unhappy fate has been made the subject of a ballad by Hood and a romance by Lord Lytton, was born in Yorkshire, 1704, executed for murder, 1759. In 1734 he set up a school at Knaresborough. About 1745 a shoemaker of that place, named Daniel Clarke, was suddenly missing under suspicious circumstances; and no light was thrown on the matter till full thirteen years afterwards, when an expression dropped by one Richard Houseman, respecting the discovery of a skeleton supposed to be Clarke's, caused him to be taken into custody. From his confession an order was issued for the apprehension of Aram, who had long quitted Yorkshire, and was at the time acting as usher at the grammar-school at Lynn.

He was brought to trial on 3rd Aug., 1759, at York, where, notwithstanding an able and eloquent defence which he made before the court, he was convicted of the murder of Clarke and sentenced to death. He was among the first to recognize the affinity of the Celtic to the other European languages, and under favourable circumstances might have done some valuable work in philological science. —Cf. W. Bristow, *The Genuine Account of the Life and Trial of Eugene Aram.*

**ARAMÆ'AN,** or **ARAMAIC.** *See* SEM-TIC LANGUAGES, SYRIAC.

**AR'AN.** An island lying off the W. coast of Donegal, Ireland, has an area of 4335 acres, a lighthouse, and a pop. of 1308, chiefly engaged in fishing.—Also called **North Island of Aram,** or **Arranmore.**

**ARANE'IDÆ.** The spider family.

**ARAN ISLANDS,** or **SOUTH ISLANDS OF ARAN.** Three islands at the mouth of Galway Bay, off the W. coast of Ireland. The largest, Aranmore or Inishmore, comprises 7635 acres, and has a pop. of 2592; the next, Inishmaan, 2252 acres, pop. 473; and the least, Inishere, 1400 acres, pop. 456. They are remarkable for a number of architectural

remains of a very early date. The inhabitants are chiefly engaged in agriculture and fishing.

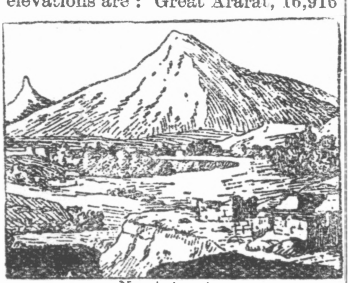
**ARANJUEZ** (à-rän-hü-eth'). A small town and palace in Spain, 30 miles from Madrid, with splendid gardens laid out by Philip II. The Court used to reside here from Easter till the close of June, when the number of people increased from 4000 to 20,000. It has a wireless station. Pop. 12,000.

**ARANY** (o-ron'y), **Janos.** Hungarian poet, born 1817, died 1882. He was for some time a strolling player, but became professor of Latin at the Normal School of Szalonta, professor of Hungarian literature at Nagy Körös, and secretary of the Hungarian Academy. Author of *The Lost Constitution*, *Katalin*, and a series of three connected narrative poems on the fortunes of Toldi.

**ARAP'AHOES.** A tribe of American Indians located near the headwaters of the Arkansas and Platte Rivers. They number in all about 2000.

**ARAPAIMA** (a-ra-pī'ma). A genus of South American fresh-water fishes, ord. Physostomi, family Osteoglossidæ, one species of which (*A. gigas*) grows to the length of 15 or 16 feet, and forms a valuable article of food in Brazil and Guiana. It is covered with large bony scales, and has a bare and bony head.

**AR'ARAT.** A celebrated mountain in Armenia, an isolated volcanic mass showing two separate cones known as the Great and Little Ararat, resting on a common base and separated by a deep intervening depression. The elevations are: Great Ararat, 16,916



Mount Ararat

feet; Little Ararat, 12,840 feet; the connecting ridge, 8780 feet. Vegetation extends to 14,200 feet, which marks the snow-line.

According to the Bible Mount Ararat was the resting-place of the Ark when the waters of the Flood abated.

**ARARO'BA,** or **ARRAROBA.** The powdered bark of *Andira araroba*. *See* ANDIRA.

**A'RAS** (the ancient **ARAXES**). A river of Asia Minor, rising S. of Erzerum at the foot of the Bingol-dagh; it flows for some miles through South Caucasia, turning eastwards to the Erivan plain N. of Ararat. It then sweeps in a semi-circle mostly between Caucasia and Persia round to its confluence with the Kur, 60 miles from its mouth in the Caspian; length, 500 miles.

**ARA'TUS.** A Greek poet, born at Soli in Cilicia; lived about 270 B.C.; was a favourite of Ptolemy Philadelphus. His poem *Phænomena* is a version of a prose work on astronomy by Eudoxus; one verse of it is quoted by St. Paul in his address to the Athenians (Acts xvii. 28).

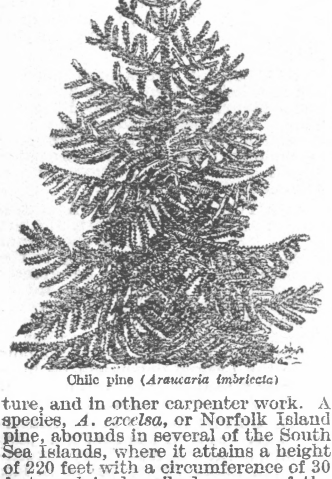
**ARA'TUS OF SICYON.** A statesman of ancient Greece, born 272 B.C. In 251 B.C. he overthrew the tyrant of Sicyon and joined that city to the Achæan League, which he greatly extended. He accepted the aid of Antigonus Doson, King of Macedon, against the Spartans, and became in time little more than the adviser of the Macedonian king, who had now made the League dependent on himself. He is said to have been poisoned by Philip V. of Macedon, 213 B.C.

**ARAUCA'NIANS.** A South American native race in the southern part of Chile, occupying a territory stretching from about 37° to 40° of S. lat. They are warlike and more civilized than many of the native races of S. America, and maintained almost unceasing war with the Spaniards from 1537 to 1773, when their independence was recognized by Spain, though their territory was much curtailed. Their early contests with the Spaniards were celebrated in Ercilla's Spanish poem *Araucana*. With the Republic of Chile they were long at feud, and in 1861 had at their head a French adventurer named Antoine de Tounens, who claimed the title of king. In 1882 they submitted to Chile. The Chilian province of Arauco receives its name from them.

**ARAUCA'RIA.** A genus of trees of the coniferous or pine order, indigenous to Australasia and South America. The species are large evergreen trees with pretty large, stiff, flattened, and generally imbricated leaves, verticillate spreading branches, and bearing large cones, each scale having a single large seed. The species *A. imbricata* (the Chile pine or monkey-puzzle), with hard, sharp, pointed leaves, was introduced into Britain in 1796. It is a native of the

mountains of Southern Chile, where it forms vast forests and yields a hard durable wood. Its seeds are eaten when roasted.

The Moreton Bay pine of New South Wales (*A. Cunninghamii*) supplies a valuable timber used in house and boat building, in making furni-



Chile pine (*Araucaria imbricata*)

ture, and in other carpenter work. A species, *A. excelsa*, or Norfolk Island pine, abounds in several of the South Sea Islands, where it attains a height of 220 feet with a circumference of 30 feet, and is described as one of the most beautiful of trees. Its foliage is light and graceful, and quite unlike that of *A. imbricata*, having nothing of its stiff formality. Its timber is of some value, being white, tough, and close-grained.

**ARAU'CO.** A province of Chile, named from the Araucanian Indians; area, 2189 sq. miles; pop. 60,233; capital, Lebu.

**ARAVAL'LI HILLS.** A range of Indian mountains running N.E. and S.W. across the Rajputána country, which they separate into two natural divisions—desert plains on the N.W. and fertile lands on the S.E.; highest point, Mount Abu (5653 feet).

**ARAEXS.** *See* ARAS.

**AR'BĂCES.** One of the generals of Sardanapălus, King of Assyria. He revolted and defeated his master, and became the founder of the Median Empire in 846 B.C.

**AR'BALIST.** *See* CROSS-BOW.

**ARBE'LA** (now **ERBIL**). A place in the vilayet of Bagdad, giving name to the decisive battle fought by Alexander the Great against Darius, at Gaugamela, about 50 miles distant from it, 1st Oct., 331 B.C.

**ARBITRAGE** (ár'bi-trázh), or **ARBITRATION OF EXCHANGES.** An operation or calculation by which the currency of one country is converted into that of another through the medium of intervening currencies, for the purpose of ascertaining whether direct or indirect drafts and remittances are preferable.—**Arbitrageur** (ár'bi-trá-zheur) is one who makes calculations of currency exchanges. *See* STOCK EXCHANGE.

**ARBITRA'TION.** The hearing and determination of a cause between parties in controversy, by a person or persons chosen by the parties. This may be done by one person, but it is common to choose more than one. Frequently two are nominated, one by each party, with a third, the *umpire* (or, in Scotland, sometimes the *oversman*), who is called on to decide in case of the primary arbitrators differing. In such a case the umpire may be agreed upon either by the parties themselves, or by the arbitrators when they have received authority from the parties to the dispute to settle this point. The determination of arbitrators is called an *award*. By the law of England the authority of an arbitrator cannot be revoked by any of the parties without the leave of the court or of a judge. —BIBLIOGRAPHY: Russell, *Arbitration*; Redman, *Arbitration*; Scots Law, see Bell, *On Arbitration*; American Law, see Morse, *Law of Arbitration*; R. G. Morris, *International Arbitration*.

**AR'BLAST.** *See* CROSS-BOW.

**ARBO'GA.** An old Swedish city, province of Westmannland; once an important commercial town, now only of historical interest from having been at one time a residence of the family of Vasa, the scene of Church assemblies and national diets, and for the antiquities in its neighbourhood. Pop. 5050.

**ARBOIS** (ár-bwä). A town of France, department of Jura; famous for its wines. Pop. 5000.

**ARBOR DAY.** A day officially set apart in the United States for the annual planting of trees by the people, and especially by school-children. The custom was instituted in 1872.

**ARBORE'TUM** (Lat. *arbor*, a tree). A place in which a collection of different trees and shrubs is cultivated for scientific or educational purposes. The largest arboretum in Britain, perhaps the finest in the whole world, is that of the Royal Gardens, at Kew,

inaugurated in 1762, to which 180 acres are now devoted. Next in celebrity are the arboreta at Edinburgh (Inverleith) and at Dublin (Glasnevin), the Botanical Gardens at Oxford, and the Botanic Gardens at Glasgow. Other arboreta are that of the Jardin des Plantes, Paris, and the Arnold Arboretum, at Jamaica Plain, Boston. The term arboretum has also been applied in a restricted sense, as in the *Arboretum Fruticetum Britannicum*, the monumental work by J. C. Loudon.

**AR'BORICULTURE.** Includes the culture of trees and shrubs, as well as all that pertains to the preparation of the soil, the sowing of the seeds, and the treatment of the plants in their young state, the preparation of the land previous to their final transplantation, their just adaptation to soil and situation, their relative growth and progress to maturity, their management during growth, and the proper season and period for felling them.

**ARBOR VITÆ** (literally, "tree of life"). The name of several coniferous trees of the genus Thuja, allied to the cypress, with flattened branchlets, and small imbricated or scale-like leaves. The name is derived from valuable medicinal properties having formerly been ascribed to the aromatic resin they mostly yield. Those generally cultivated in Britain are: the common Arbor Vitæ (*Thuja occidentālis*), a native of North America, where it grows to a height of 40 or 50 feet, introduced into Britain about 1566; the giant Arbor Vitæ or Red Cedar (*Thuja gigantea*), introduced in 1854; and the Chinese Arbor Vitæ (*Thuja orientalis*).

**ARBROATH** (ar-brōth'), or **ABERBROTHOCK.** A royal municipal and police burgh and seaport in the county of Forfar, Scotland, at the mouth of the small River Brothock. Its ancient abbey, founded by William the Lion in 1178, and dedicated to Saints Mary and Thomas à Becket, is now a picturesque ruin. There are numerous flax and hemp spinning-mills and factories, and much canvas and linen is made; also tanning, shoe-making, and fishing, and a small shipping trade, but the harbour is bad. Pop. (1931), 17,637. It unites with Montrose, Forfar, Brechin, and Inverbervie (the Montrose burghs) in sending a member to Parliament.

**ARBUTH'NOT, John.** An eminent physician and distinguished wit, born at Arbuthnot, Kincardineshire, Scotland, 1667, died 1735. He received the degree of Doctor of Medicine at the University of St. Andrews, and went to London, where he soon distinguished himself by his writings and by his skill in his profession. In 1704 he was chosen Fellow of the Royal Society, and soon after he was appointed physician extraordinary, and then physician in ordinary to Queen Anne. About this time he became intimate with Swift, Pope, Gay, and other wits of the day. His writings, other than professional or scientific, include his contributions (in conjunction with Swift and Pope) to the *Memoirs of Martinus Scriblerus, History of John Bull, Art of Political Lying*, etc. He was conspicuous not only for learning and wit, but also for worth and humanity.

**AR'BUTUS.** A genus of plants belonging to the Ericaceæ, or heath order, and comprising a number of small trees and shrubs, natives chiefly of Europe and N. America. *Arbūtus Unēdo* abounds near the lakes of Killarney, where its fine foliage adds charms to the scenery. The bright red or yellow berries, somewhat like the strawberry, have an unpleasant taste and narcotic properties. The Corsicans make wine from them. The trailing arbutus or may-flower of N. America, a plant with fragrant and beautiful blossoms, is *Epigæa repens*, of the same nat. ord.

**ARC.** A portion of a curved line, especially of a circle. It is by means of circular arcs that all angles are measured.—*Electric* or *Voltaic arc*, the luminous arc of intense brightness and excessively high temperature which is formed by an electric current in crossing over the interval of space between the carbon points of an electric lamp. *See* ARC-LIGHT.

**ARC, Jeanne d'.** *See* JOAN OF ARC.

**AR'CA.** A genus of bivalve molluscs, family Arcadæ, whose shells are known as *ark-shells*.

**ARCACHON** (ar-kà-shōn). A town of S.W. France, department Gironde, on the almost land-locked basin of Arcachon, a much-frequented bathing place, with great oyster-breeding establishments. It is connected by railway with Bordeaux. Pop. 10,266.

**ARCADE.** A series of arches supported on piers or pillars, used generally as a screen and support of a roof, or of the wall of a building, and having beneath the covered part an ambulatory as round a cloister, or a footpath with shops or dwellings, as frequently seen in old Italian towns. Sometimes a porch or other prominent part of an important building is treated with arcades. At the present day Bologna, Padua,

and Berne have fine examples of mediæval arcaded streets, and among more modern work various streets in Turin, and the Rue de Rivoli, Paris, are lined with arcades, with shops underneath.

In mediæval architecture the term arcade is also applied to a series of arches supported on pillars forming an ornamental dressing or enrichment of a wall, a mode of treatment of very frequent occurrence in the towers, apses, and other parts of churches. In modern use the name arcade is often applied to a passage or narrow street containing shops arched over and covered with glass, as for example the Burlington Arcade, London, the Royal Arcade at Newcastle, and the Galleria Vittorio Emmanuele in Milan.

**ARCA'DIA.** The central and most mountainous portion of the Peloponnesus (Morea), the inhabitants of which in ancient times were celebrated for simplicity of character and manners. Their occupation was almost entirely pastoral, and thus the country came to be regarded as typical of rural simplicity and happiness. At the present day Arcadia forms a nomarchy of the kingdom of Greece. Area, 2028 sq. miles. Pop. 151,658.

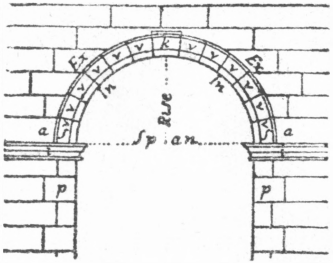
**ARCA'DIUS.** Born in 377, died 408; son of the Emperor Theodosius, on whose death in 395 the empire was divided, he obtaining the East, and his brother Honorius the West. He proved a feeble and pusillanimous prince.

**ARCANUM, THE GREAT** (meaning secret). A term applied in the Middle Ages to the highest problems of alchemy and the discovery of the supposed great secrets of nature, such as the philosopher's stone and the elixir of life. *See* ALCHEMY.

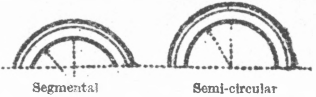
**ARCATURE.** In architecture, a small arcade built into a wall or applied against it, decorative rather than structural. Arcatures occur in Anglo-Norman churches of the twelfth and thirteenth centuries.

**ARCESILAUS** (ar-ses-i-lā'us). A Greek philosopher, the founder of the second or middle academy, was born about 315 B.C., died 239 B.C. He left no writings, and of his opinions so little is known that it has been doubted whether he was a strict Platonist or a sceptic.

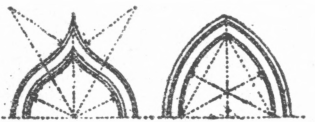
**ARCH.** A structure composed of separate pieces, such as stones or bricks, having the shape of truncated wedges, arranged on a curved line, so as to retain their position by mutual pressure. The separate stones which compose the arch are called



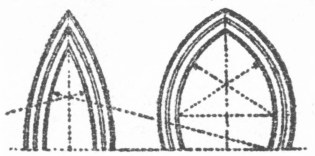

*voussoirs* or *arch-stones*; the extreme or lowest voussoirs are termed *springers*, and the uppermost or central one is called the *keystone*. The under or concave side of the voussoirs is called the *intrados*, and




the upper or convex side the *extrados* of the arch. The supports which afford resting and resisting points to the arch are called *piers* and *abutments*. The upper part of the pier or abutment, where the arch




rests—technically where it *springs from*—is the *impost*. The *span* of an arch is in circular arches the length of its chord, and generally the width between the points of its opposite imposts whence it springs. The *rise*




of an arch is the height of the highest point of its intrados above the line of the imposts; this point is sometimes called the *under side of the crown*, the highest point of the extrados being the *crown*. Arches are designated in various ways, as from the shape (circular, elliptic, etc.), or from the resemblance of the whole contour

OLDER STONE AGE: 1, Flint Pick. 2, Carved Mammoth Tusk. 3, Double Scraper. 4, Barbed Harpoon Heads. LATER STONE AGE: 5, Pick of Deer Antler. 6, Flint and Pyrites. 7, Stone Celt in Haft. 8, Arrowhead. 9, Bowl. BRONZE AGE: 10, Celt. 11, Drinking-cup. 12, Ornamental Pin. 13, Spear-head. 14, Bronze Tweezers. 15, 16, Gold Bracelets. 17, Engraved Pin. 18, Short Sword. 19, Spectacle Brooch. 20, Razor. EARLY IRON AGE: 21, Bronze Brooch. 22, Bone Hand-comb for weaving. 23, Bronze Mirror. 24, Bronze Jug. 25, Bronze Spoon. 26, Iron Currency Bars. 27, Bronze Brooch.

of the curve to some familiar object (lancet arch, horse-shoe arch), or from the method used in describing the curve, as equilateral, three-centred, four-centred, ogee, and the like; or from the style of architecture to which they belong, as Roman, pointed, and Saracenic arches.—**Triumphal arch**, originally a simple decorated arch under which a victorious Roman general and army passed in triumph. At a later period the triumphal arch was a richly-sculptured, massive, and permanent structure, having an archway passing through it, with generally a smaller arch on either side. The name is sometimes given to an arch, generally of wood decorated with flowers or evergreens, erected on occasion of some public rejoicing, etc.

**ARCHÆAN** (ärk-kē'an) **ROCKS** (Gr. *archaios*, ancient). The oldest rocks of the earth's crust, mostly crystalline in character, and embracing granites, gneisses, mica-schists, etc., all devoid of fossil remains. These rocks underlie a group of stratified and igneous masses that are usually distinguished from them as Huronian; the first beds with a well-marked fauna (lowest Cambrian) lie above the Huronian, and the Huronian and the Archæan groups are often conveniently classed together as pre-Cambrian, and are separated from the stratified and fossiliferous formations, which indeed have chiefly taken origin from them. The core of the Malvern range, and the rocks of N.W. Sutherland, are examples of Archæan masses in Great Britain.

**ARCHÆOL'OGY** (Gr. *archaios*, ancient, and *logos*, a discourse). The study of antiquity, or the science which takes cognizance of the history of nations and peoples as evinced by the remains, architectural, implemental, or otherwise, which belong to the earlier epoch of their existence. In a more extended sense the term embraces every branch of knowledge which bears on the origin, religion, laws, languages, science, arts, and literature of ancient peoples. It is to a great extent synonymous with *prehistoric annals*, as a large if not the principal part of its field of study extends over those periods in the history of the human race in regard to which we possess almost no information derivable from written records.

**The Three Ages.** Archæology divides the primeval period of the human race, more especially as exhibited by remains found in Europe, into the *stone*, the *bronze*, and the *iron* ages, these names being given in accordance with the materials employed for weapons, implements, etc., during the particular period. The *stone* age has been subdivided into the *palæolithic* and *neolithic*, the former being that older period, in which the stone implements were not polished as they are in the latter and more recent period.

The *bronze* age, which admits of a similar subdivision, is that in which implements were of copper or bronze. In this age the dead were burned and their ashes deposited in urns or stone chests, covered with conical mounds of earth or cairns of stones. Gold and amber ornaments appear in this age.

The *iron* age is that in which implements, etc., of iron begin to appear, although stone and bronze implements are found along with them. The word *age* in this sense (as explained under *Age*) simply denotes the stage at which a people has arrived. The phrase stone age, therefore, merely marks the period before the use of bronze, the bronze age that before the employment of iron, among any specific people. *See* EXCAVATIONS; CRETE; EGYPT, etc.—BIBLIOGRAPHY: Sir J. Evans, *Stone Implements of Great Britain*; Boyd-Dawkins, *Early Man in Britain*; J. Geikie, *Prehistoric Europe*; R. Munro, *Lake Dwellings of Europe*; Sir W. Ridgeway, *Early Age of Greece*; H. R. Hall, *Ægean Archæology*; W. M. Flinders Petrie, *Methods and Aims in Archæology*; A. P. F. Michaelis, *A Century of Archæological Discoveries*.

**ARCHÆOPTERYX** (ärk-kē-op'teriks). A fossil bird from the oolitic limestone of Solenhofen, of the size of a rock, and differing from all

Archæopteryx macrura, a fossil lizard-tailed bird

known birds in having two free claws representing the thumb and forefinger projecting from the wing, and about twenty tail vertebræ free and prolonged as in mammals.

**ARCHANGEL** (ärk'ān-jel; Gr. pre-

fix, *arch-*, denoting chief). An angel of superior or of the highest rank. The only archangel mentioned by name in Scripture is Michael in the Epistle of Jude.

**ARCHANGEL** (ärk-ān'jel). A seaport, capital of the Russian government of same name, on the right bank of the Northern Dvina, about 20 miles above its mouth in the White Sea. Below the town the river divides into several branches and forms a number of islands, on one of which, called Sollenbole, is the harbour. Archangel, founded in 1584, was long the only port which Russia possessed. It is capital of the autonomous area of Archangel; area, 38,260 sq. miles; pop. 126,256. The place has some manufactures and an important trade, exporting linseed, flax, tow, tallow, train-oil, mats, timber, pitch and tar, etc. The port is closed for six months by ice. During the European War it was a supply base for the Russian army. British troops occupied it in 1915, and in 1919 a relief expedition was sent to enable them to withdraw. Pop. (1926), 72,634.

**ARCHANGEL'ICA.** *See* ANGELICA.

**ARCHBISHOP** (ärch-). A chief bishop, or bishop over other bishops; a metropolitan prelate. The establishment of this dignity is to be traced up to an early period of Christianity, when the bishops and inferior clergy met in the capitals to deliberate on spiritual affairs, and the bishop of the city where the meeting was held presided.

In England there are two archbishops—those of Canterbury and York; the former styled *Primate of all England*, the latter *Primate of England*. The Archbishop of Canterbury is the first peer of the realm, having precedence before all great officers of the Crown and all dukes not of royal birth. He crowns the sovereign, and when he is invested with his archbishopric he is said to be enthroned. He can grant special licences to marry at any time or place, and can confer degrees otherwise to be obtained only from the universities. He is addressed by the titles of *your grace* and *most reverend father in God*, and writes himself *by divine providence*, while the Archbishop of York and the bishops only write *by divine permissim*.

The first Archbishop of Canterbury was Augustine, appointed A.D. 598 by Ethelbert. Next in dignity is the Archbishop of York, between whom and the Archbishop of Canterbury the Lord High-Chancellor of England has his place in precedency. The first Archbishop of York was Paulinus, appointed in 622. The incomes of the sees are £15,000 and £10,000 respectively.

An Archbishop of Wales was first appointed in 1920. Scotland had two archbishops—St. Andrews and Glasgow. Ireland had four, but the Episcopal Church has but two—Armagh and Dublin, the former being *Primate of all Ireland*, the latter *Primate of Ireland*. There are four Roman Catholic archbishops in England and Wales—Westminster, Cardiff, Birmingham, and Liverpool; two in Scotland—St. Andrews and Edinburgh, and Glasgow; four in Ireland—Armagh, Dublin, Cashel, and Tuam.

**ARCHDEACON** (ärch-). In England, an ecclesiastical dignitary next in rank below a bishop, having a certain jurisdiction over a part of the diocese. From two to four archdeacons are appointed by the bishops under whom they perform their duties, and they hold courts which decide cases subject to an appeal to the bishop.

**ARCHDUKE.** A title peculiar to the royal family of Austria—the Hapsburgs, who ruled until 1918.

**ARCHELAUS** (ärk-kē-lā'us). The name of several personages in ancient history, one of whom was the son of Herod the Great. He received from Augustus the sovereignty of Judea, Samaria, amd Idumea. The people, tired of his tyrannical and bloody reign, accused him before Augustus, who banished him to Gaul.

**ARCHER-FISH.** A name given to the *Toxōtes jaculātor*, a scaly-finned, acanthoptervgian fish, about 6 inches long, inhabiting the seas around Java, which has the faculty of shooting drops of water to the distance of 3 or 4 feet at insects, thereby causing them to fall into the water, when it seizes and devours them. The soft, and even the spiny portions of their dorsal fins are so covered with scales as to be scarcely distinguishable from the rest of the body.

**ARCHER, Frederick James.** English jockey. He was born at Cheltenham, Jan. 11, 1857, rode his first winner at Chesterfield in 1870, and had a wonderful, although short, career, for he shot himself at Newmarket, when ill of typhoid fever, Nov. 8, 1886. From 1873 to 1885 Archer was at the top of the list of winning jockeys. Five times he rode a Derby winner; altogether he won 2748 races.

**ARCHER, William.** Journalist and miscellaneous writer, born at Perth, Scotland, in 1856. Educated at

Edinburgh University, he went to London after some experience of journalism at Edinburgh, and after a visit to Australia was called to the bar, and was dramatic critic for *The World* from 1884 to 1905. Subsequently he has been dramatic critic for *The Tribune* and *The Nation*.

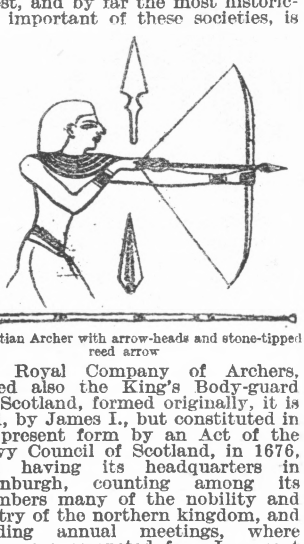
**Works.** He has done much to introduce Ibsen to the English public, by translating his dramas and otherwise, and has written *English Dramatists of To-day*; *A Life of Macready*; *About the Theatre*; *Essays and Studies*; *Masks or Faces?*; *a Study on the Psychology of Acting*; *The Theatrical World* (a collection of his dramatic criticisms) (5 vols.); *Study and Stage*; *America To-Day* (the result of a visit in 1900); *Poets of the Younger Generation*; *Real Conversations* (the result of a series of interviews with persons of note); *Through Afro-America* (1910); *The Life, Trial, and Death of Francisco Ferrer* (1911); *Play-Making* (1912); *The Thirteen Days* (1915); *India and the Future* (1917). He died in 1924.

**ARCH'ERY.** The art of shooting with a bow and arrow. The use of these weapons in war and the chase dates from the earliest antiquity. Ishmael, we learn from Gen. xxi., "became an archer." The Egyptians, Assyrians, Persians, Parthians, excelled in the use of the bow; and while the Greeks and Romans themselves made little use of it, they employed foreign archers as mercenaries. Coming to much more recent times, we find the Swiss famous as archers, but they generally used the arbalist or cross-bow, and were no match for their English rivals, who preferred the long-bow. (*See* Bow).

An Assyrian Archer

The English victories of Cressy, Poictiers, and Agincourt, gained against apparently overwhelming odds, may be ascribed to the bowmen. Archery disappeared gradually as firearms came into use, and as an instrument of war or the chase the bow is now confined to the most savage tribes of both hemispheres. But though the bow has been long abandoned among civilised nations as a military weapon, it is still cherished as an instrument of healthful recreation, encouraged by archery clubs or societies, which have been established in many parts of Britain.

**Royal Company of Archers.** The oldest, and by far the most historically important of these societies, is



Egyptian Archer with arrow-heads and stone-tipped reed arrow

the Royal Company of Archers, called also the King's Body-guard for Scotland, formed originally, it is said, by James I., but constituted in its present form by an Act of the Privy Council of Scotland, in 1676, and having its headquarters in Edinburgh, counting among its members many of the nobility and gentry of the northern kingdom, and holding annual meetings, where prizes are competed for. In recent years a number of clubs have been formed in the United States. Archery has the merit of forming a sport open to women as well as men.—BIBLIOGRAPHY: William Garrard, *The Arte of Warre*; E. S. Morse, *Archery, Ancient and Modern*; H. A. Ford, *The Theory and Practice of Archery*.

**ARCHES, Court of.** The chief and most ancient consistory court, belonging to the archbishopric of Canterbury, for the debating of spiritual causes. It is named from the church in London, St. Mary le Bow, or Bow Church (so called from a fine *arched* crypt), where it was formerly held. The jurisdiction of this court extends over the province of Canterbury. The office of president

or dean is now merged in that of the judge appointed by the Public Worship Regulation Act (1874). The court now sits in the library of Lambeth Palace.

**ARCHIL,** or **ORCHIL** (ar'kil, or'-kil). A red, violet, or purple colouring matter obtained from various kinds of lichens, the most important of which are the *Roccella tinctoria* and the *R. fuciformis*, natives of the rocks of the Canary and Cape Verde Islands, Mozambique and Zanzibar, South America, etc., and popularly called dyer's-moss. The dye is used for improving the tints of other dyes, as from its want of permanence it cannot be employed alone; but the aniline colours have largely superseded it. Cudbear and litmus are of similar origin.

**ARCHILOCHUS** (ar-kil'o-kus) of **Paros.** One of the earliest Ionian lyric poets, the first Greek poet who composed iambic verses according to fixed rules. He flourished about 700 B.C. His iambic poems were renowned for force of style, liveliness of metaphor, and a powerful but bitter spirit of satire. In other lyric poems of a graver character he was also considered as a model. All his works are lost but a few fragments.

**ARCHIMAN'DRITE.** In the Greek Church, an abbot or abbot-general, who has the superintendence of many abbots and convents. The title dates from the fourth century.

**ARCHIME'DEAN SCREW.** A machine for raising water, said to have been invented by Archimedes. It is formed by winding a tube spirally round a cylinder so as to have the form of a screw, or by hollowing out the cylinder itself into a double or triple-threaded screw and enclosing it in a water-tight case. When the screw is placed in an inclined position and the lower end immersed in water, by causing the screw to revolve the water may be raised to a limited extent.

**ARCHIMEDES** (ar-ki-me'dēz). A celebrated ancient Greek physicist and geometrician, born at Syracuse, in Sicily, about 287 B.C. He devoted himself entirely to science, and enriched mathematics with discoveries of the highest importance, upon which the moderns have founded their admeasurements of curvilinear surfaces and solids. Archimedes is the only one among the ancients who has left us anything satisfactory on the theory of mechanics and on hydrostatics.

**Archimedes' Principle.** He first caught the hydrostatic principle to which his name is attached, "that a body immersed in a fluid loses as much in weight as the weight of an equal volume of the fluid," and determined by means of it that an artist had fraudulently added too much alloy to a crown which King Hiero had ordered to be made of pure gold. He discovered the solution of this problem while bathing; and it is said to have caused him so much joy that he hastened home from the bath undressed, and crying out, *Eurēka! Eurēka!* "I have found it, I have found it;"

**Inventions.** Practical mechanics also received a great deal of attention from Archimedes, who boasted that if he had a fulcrum or standpoint he could move the world. He is the inventor of the compound pulley, probably of the endless screw, the Archimedean screw, etc. During the siege of Syracuse by the Romans he is said to have constructed many wonderful machines with which he repelled their attacks, and he is stated to have set on fire their fleet by burning-glasses. At the moment when the Romans gained possession of the city by assault (212 B.C.), tradition relates that Archimedes was slain while sitting in the market-place contemplating some mathematical figures which he had drawn in the sand.

**ARCHIPEL'AGO.** A term originally applied to the Ægean, the sea lying between Greece and Asia Minor, then to the numerous islands situated therein, and subsequently to any cluster of islands. In the Grecian Archipelago the islands nearest the European coast lie together almost in a circle, and for this reason are called the *Cyclades* (Gr. *kyklos*, a circle); those nearest the Asiatic, being farther from one another, the *Sporades* ("scattered"). (*See these articles, and* NEGROPONT, SCIO, SAMOS, RHODES, CYPRUS, etc.). The Malay, Indian, or Eastern Archipelago, on the east of Asia, includes Borneo, Sumatra, and other large islands.

**ARCHITEC'TURE.** In a general sense, is the art of designing and constructing houses, bridges, and other buildings for the purposes of civil life; or, in a more limited but very common sense, that branch of the fine arts which has for its object the production of edifices not only convenient for their special purpose, but characterised by unity, beauty, and often grandeur.

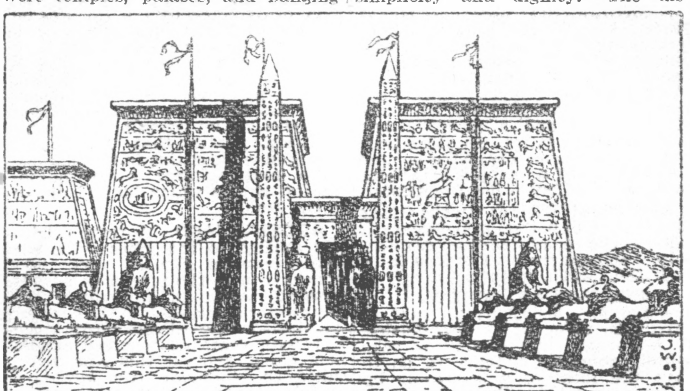
The first habitations of man were such as nature afforded, or cost little labour to the occupant—caves, huts, and tents. But as soon as men rose in civilisation and formed settled

societies they began to build more commodious and comfortable habitations. They bestowed more care on the materials, preparing bricks of clay or earth, which they at first dried in the air, but afterwards baked by fire; and subsequently they smoothed stones and joined them at first without, and at a later period with, mortar or cement. After they had learned to build houses, they erected temples for their gods on a larger and more splendid scale than their own dwellings.

The Egyptians are the most ancient nation known to us among whom architecture had attained the character of a fine art. Other ancient peoples among whom it had made great progress were the Babylonians, whose most celebrated buildings were temples, palaces, and hanging gardens; the Assyrians, whose capital, Nineveh, was rich in splendid buildings; the Phœnicians, whose cities, Sidon, Tyre, etc., were adorned with equal magnificence; and the Israelites, whose temple was a wonder of architecture. But comparatively few architectural monuments of these nations have remained till our day.

**Egyptian.** This is not the case with the architecture of Egypt, however, of which we possess ample remains in the shape of pyramids, temples, sepulchres, obelisks, etc. Egyptian chronology is far from certain, but the greatest of the architectural monuments of the country, the pyramids of Ghizeh, are at least as old as 2800 or 2700 B.C. The Egyptian temples had walls of great thickness and sloping on the outside from bottom to top; the roofs were flat, and composed of blocks of stone reaching from one wall or column to another. The columns were numerous, close, and very thick, generally without bases, and exhibiting great variety in the designs of their capitals. The principle of the arch, though known, was not employed for architectural purposes. Statues of enormous size, sphinxes carved in stone, and on the walls sculptures in outline of deities and animals, with innumerable hieroglyphics, are the decorative objects which belong to this style.

**Grecian.** The earliest architectural remains of Greece are of unknown antiquity, and consist of massive walls built of huge blocks of stone. In historic times the Greeks developed an architecture of noble simplicity and dignity. The discoveries in Crete and Argolis have shown that Greek architecture owes much less than was supposed to Egyptian and Chaldæan architecture. It is considered to have attained its greatest perfection in the age of Pericles, or about 460-430 B.C. The great masters of this period were Phidias, Ictinus, Callicrates, etc. All the extant buildings are more or less in ruins. The style is characterised by beauty, harmony, and simplicity in the highest degree.



Egyptian—Restoration of Temple of Luxor

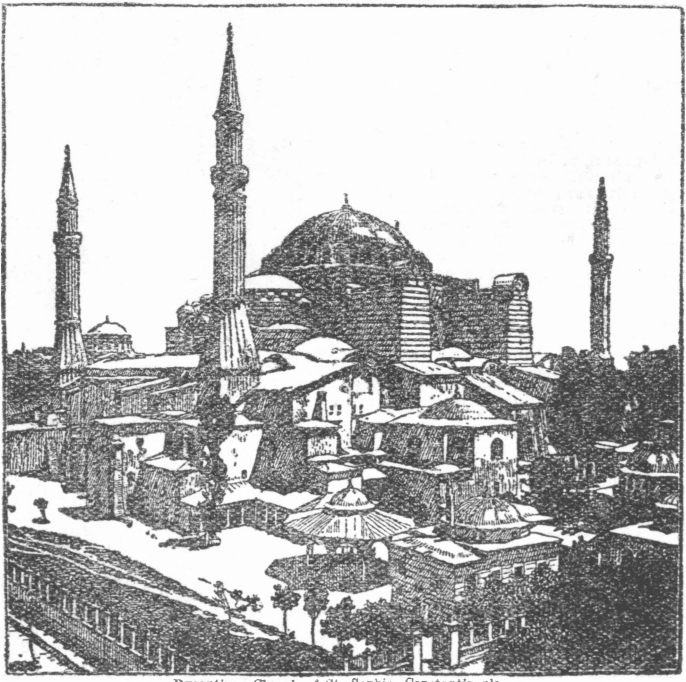
Distinctive of it are what are called the *orders* of architecture, by which term are understood certain modes of proportioning and decorating the column and its superimposed entablature. The Greeks had three orders, called respectively the *Doric*, *Ionic*, and *Corinthian*. (*See articles under these names*). Greek buildings were abundantly adorned

with sculptures, and painting was extensively used, the details of the structures being enriched by different colours or tints. Lowness of roofs and the absence of arches were distinctive features of Greek architecture, in which, as in that of Egypt, horizontality of line is another characteristic mark. The most remarkable public edifices of the Greeks were temples, of which the most famous is the Parthenon at Athens.

Others exist in various parts of Greece as well as in Sicily, Southern Italy, Asia Minor, etc., where important Greek communities were early settled. Their theatres were semicircular on one side and square on the other, the semicircular part being usually excavated in the side of some convenient hill. This part, the auditorium, was filled with concentric seats, and might be capable of containing 20,000 spectators. A number exist in Greece, Sicily, and Asia Minor, and elsewhere. By the end of the Peloponnesian War (c. 400 B.C.) the best period of Greek architecture was over; a noble simplicity had given place to excess of ornament. After the death of Alexander the Great (323 B.C.) the decline was still more marked.

**Roman.** Among the Romans there was no original development of architecture as among the Greeks, though they early took the foremost place in the construction of such works as aqueducts and sewers, the arch being in early and extensive use among this people. As a fine art, however, Roman architecture had its origin in copies of the Greek models, all the Grecian orders being introduced into Rome, and variously modified. Their number, moreover, was augmented by the addition of two new orders—the *Tuscan* and the *Composite*. The Romans became acquainted with the architecture of the Greeks soon after 200 B.C., but it was not till about two centuries later that the architecture of Rome attained (under Augustus) its greatest perfection.

Among the great works now



Byzantine—Church of St. Sophia, Constantinople

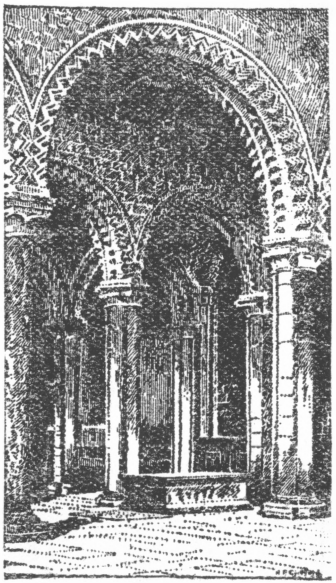
erected were temples, aqueducts, amphitheatres, magnificent villas, triumphal arches, monumental pillars, etc. The *amphitheatre* differed from the theatre in being a completely circular or rather elliptical building, filled on all sides with ascending seats for spectators and leaving only the central space, called the *arena*, for the combatants and public shows. The Coliseum is a stupendous structure of this kind. The *thermæ*, or baths, were vast structures in which multitudes of people could bathe at once. Magnificent tombs were often built by the wealthy. Remains of private residences are numerous, and the excavations at Pompeii in particular have thrown great light on the internal arrangements of the Roman dwelling-house.

Almost all the succcessors of Augustus embellished Rome more or less, erected splendid palaces and temples, and adorned, like Hadrian, even the conquered countries with them. But after the period of Hadrian (A.D. 117-138) Roman architecture is considered to have been on the decline. The refined and noble style of the Greeks was neglected, and there was an attempt to embellish the beautiful more and more. This decline was all the more rapid at a later time owing to the disturbed state of the Empire and the incursions of the barbarians.

**Byzantine.** In Constantinople, after its virtual separation from the Western Empire, arose a style of art and architecture which was practised by the Greek Church during the whole of the Middle Ages. This is called the Byzantine style. The church of St. Sophia at Constantinople, built by Justinian (reigned 527-565), offers the most typical specimen of the style, of which the fundamental principle was an application of the Roman arch, the dome being the most striking feature of the building. In the most typical examples the dome or cupola rests on four pendentives.

**Lombard and Norman Romanesque.** After the dismemberment of the Roman Empire the beautiful works of ancient architecture were almost entirely destroyed by the Goths, Vandals, and other barbarians in Italy, Greece, Asia, Spain, and Africa; or what was spared by them was ruined by the fanaticism of the Christians. A new style of architecture now arose, two forms of which, the Lombard and the Norman Romanesque, form important phases of art. The Lombard prevailed in North Italy and South Germany from the eighth or ninth to the thirteenth century (though the Lombard rule came to an end in 774); the Norman Romanesque flourished, especially in Normandy and England, from the eleventh to the middle of the thirteenth century. The semicircular arch is the most characteristic feature of this style. With the Lombard Romanesque were combined Byzantine features, and buildings in the pure Byzantine style were also erected in Italy, as the church of St. Mark at Venice.

**Moorish or Saracenic.** The conquests of the Moors introduced a



An example of Norman Romanesque architecture—Galilee Chapel, Durham Cathedral

fresh style of architecture into Europe after the eighth century—the Moorish or Saracenic. This style accompanied the spread of Mahommedanism after its rise in Arabia in the seventh century. The edifices erected by the Moors and Saracens in Spain, Egypt, and Turkey are distinguished, among other things, by a peculiar form of the arch, which forms a curve constituting more than half a circle or ellipse. A peculiar flowery decoration, called *arabesque*, is a common ornament of this style, of which the building called the Alhambra (q.v.) is perhaps the chief glory.

**Gothic.** The Germans were un-

Italian Gothic—Doges' Palace, Venice

acquainted with architecture until the time of Charlemagne. He introduced into Germany the Byzantine and Romanesque styles. Afterwards the Moorish or Arabian style had some influence upon that of the Western nations, and thus originated the mixed style which maintained itself till the middle of the thirteenth century. Then began the modern Gothic style, which grew up in France, England, and Germany. Its striking characteristics are its pointed arches, its pinnacles and spires, its large buttresses, clustered pillars, vaulted roofs, profusion of ornament, and, on the whole, its lofty, bold character. Its most distinctive feature, as compared with the Greek or the Egyptian style, is the predominance in it of perpendicular or rising lines, producing forms that convey the idea of soaring or mounting upwards. Its greatest capabilities have been best displayed in ecclesiastical edifices. The Gothic style is divided into four principal epochs: the Early Pointed, or general style of the thirteenth century; the Decorated, or style of the fourteenth century; the Perpendicular, practised during the fifteenth and early part of the sixteenth centuries; and the Tudor, or general style of the sixteenth century. This style lasted in England up to the seventeenth century, being gradually displaced by that branch of the Renaissance or modified revival of ancient Roman architecture which is known as the *Elizabethan style*, and which is perhaps more purely an English style than any other that can be named.

**Renaissance.** The rise of the Renaissance style in Italy is the greatest event in the history of architecture after the introduction of the Gothic style. The Gothic style had been introduced into the country and extensively employed, but had never been thoroughly naturalised. The Renaissance is a revival of the classic style based on the study of the ancient models; and having practically commenced in Florence about the beginning of the fifteenth century, it soon spread with great rapidity over Italy and the greater part of Europe. The most illustrious architects of this early period of the style were Brunelleschi, who built at Florence the dome of the cathedral, the Pitti Palace, etc., besides many edifices at Milan, Pisa, Pesaro, and Mantua; Alberti, who wrote an important work on architecture, and erected many beautiful churches; Bramante, who began the building of St. Peter's, Rome, and Michelangelo, who erected its magnificent dome. On St. Peter's were also employed Raphael, Peruzzi, and San Gallo. The noblest building in this style of architecture in Britain is St. Paul's, London, the work of Sir Christopher Wren.

**Modern.** Since the Renaissance period there has been no architectural development requiring special

note. In buildings erected at the present day some one of the various styles of architecture is employed according to taste. Modern dwelling-houses have necessarily a style of their own as far as stories and apartments and windows and chimneys can give them one. In general the Grecian style, as handed down by Rome and modified by the Italian architects of the Renaissance, from its right angles and straight entablatures, is more convenient, and fits better with the distribution of our common buildings, than the pointed and irregular

Notable modern buildings in this country are the Shell-Mex Building, the London County Council Hall and Liverpool Cathedral, the last-named designed by Sir Giles Gilbert Scott.

**Indian and Chinese.** A few words may be added on the architecture of India and China. Although many widely-differing styles are to be found in India, the oldest and only true native style of Indian ecclesiastical architecture is the Buddhist, the earliest specimens dating from 250 B.C. Among the chief objects of Buddhist art are *stupas* or *topes*, built

Renaissance—St. Peter's, Rome

Gothic. But the occasional introduction of the Gothic outline and the partial employment of its ornaments has undoubtedly an agreeable effect both in public and private edifices; and we are indebted to it, among other things, for the spire, a structure exclusively Gothic, which, though often misplaced, has become an object of general approbation and a pleasing landmark to cities and villages. The works most characteristic of the present day are the large bridges, viaducts, etc., in many of which iron is the sole or most characteristic portion of the material.

in the form of large towers, and employed as *dágobas* to contain relics of Buddha or of some noted saint. Other works of Buddhist art are temples or monasteries excavated from the solid rock, and supported by pillars of the natural rock left in their places. Buddhist architecture is found in Ceylon, Tibet, Java, etc., as well as in India. The most remarkable Hindu or Brahmanical temples are in Southern India. They are pyramidal in form, rising in a series of stories. The Saracenic or Mohammedan architecture afterwards introduced into India is, of course,

of foreign origin. The Chinese have made the *tent* the elementary feature of their architecture; and of their style any one may form an idea by inspecting the figures which are depicted upon common chinaware. Chinese roofs are concave on the upper side, as if made of canvas instead of wood. (For further information *see* GREECE, section ANCIENT GREEK ART; EGYPT; GOTHIC ARCHITECTURE, etc.; CORBIE STEPS, CORBEL, COLUMN, AQUEDUCT, CORINTHIAN, DORIC, IONIC, etc.)—BIBLIOGRAPHY: J. Ruskin, *Seven Lamps of Architecture*; E. A. Freeman, *History of Architecture*; Viollet-le-Duc, *How to build a House*; J. T. Micklethwaite, *Modern Parish Churches*; H. H. Statham, *Architecture for General Readers* and *Critical History of Architecture*; J. Fergusson, *History of Architecture in all Countries*; F. M. Simpson, *A History of Architectural Development*; *Cyclopedia of Architecture*.

**ARCHITRAVE** (ăr-ki-trāv). In architecture, the part of an entablature which rests immediately on the heads of the columns, being the lowest of its three principal divisions, the others being the *frieze* and the *cornice*.

**ARCHIVES** (ăr'kīvz). *See* RECORDS.

**ARCHIVOLT** (ăr'ki-volt). In architecture, the ornamental band of mouldings on the face of an arch and following its contour.

**ARCHONS** (ăr'konz). The chief magistrates of ancient Athens, chosen to superintend civil and religious concerns. They were nine in number; the first was properly the *archŏn*, or *archŏn eponymŏs*, by whose name the year was distinguished in the public records; the second was called *archŏn basileus*, or king archon, who exercised the functions of high priest; the third, *polemarchos*, or general of the forces. The other six were called *thesmothĕtai*, or legislators.

**ARCHYTAS** (ăr-kī'tas). An ancient Greek mathematician, statesman, and general, who flourished about 400 B.C., and belonged to Tarentum in Southern Italy. The invention of the analytic method in mathematics is ascribed to him, as well as the solution of many geometrical and mechanical problems. He constructed various machines and automata, among the most celebrated of which was his flying pigeon. He was a Pythagorean in philosophy, and Plato and Aristotle are said to have been both deeply indebted to him. Only inconsiderable fragments of his works are extant.

**ARCIS-SUR-AUBE** (ăr-sē-sûr-ōb). A small town of France, department Aube, at which, in 1814, was fought a battle between Napoleon and the Allies, after which the latter marched to Paris. Pop. 3000.

**ARC-LIGHT.** A certain kind of electric light in which the illuminating source is the current of electricity passing between two sticks of carbon kept a short distance apart, one of them being in connection with the positive, the other with the negative terminal of a battery or dynamo.

**ARCO.** A town of Tirol, near Lake Garda, a favourite winter resort of invalids. Pop. 3800.

**ARCOLE** (ăr'ko-lā). A village in North Italy, 15 miles S.E. of Verona, celebrated for the battles of 15th, 16th, and 17th Nov., 1796, fought between the French under Bonaparte and the Austrians, in which the latter were defeated with great slaughter.

**ARCOS' DE LA FRONTE'RA.** A city of Spain, 30 miles E. by N. from Cadiz, on the Guadalete, here crossed by a stone bridge, on a sandstone rock 570 feet above the level of the river. On the highest part of the rock stands the castle of the dukes of Arcos, partly in ruins. The principal manufactures are leather, hats, and cordage. Pop. 13,980.

**AR'COT.** Two districts and a town of India, within the Presidency of Madras.—**North Arcot** is an inland district with an area of 4920 sq. miles. The country is partly flat and partly mountainous, where intersected by the Eastern Ghâts. Pop. 1,960,960.—**South Arcot** lies on the Bay of Bengal, and has two seaports, Cuddalor and Porto Novo. Area, 4208 sq. miles; pop. 2,362,566.—The town **Arcot** is in North Arcot, on the Palar, about 70 miles W. by S. of Madras. There is a military cantonment at 3 miles' distance. The town contains handsome mosques, a nabob's palace in ruins, and the remains of an extensive fort. Arcot played an important part in the wars which resulted in the ascendancy of the British in India. It was taken by Clive, 31st Aug., 1751, and heroically defended by him against an apparently overwhelming force under Raja Sahib. Pop. 11,475.

**ARCTIC** (ărk'tik). An epithet given to the north pole from the proximity of the constellation of the Bear, in Greek called *arktos*. The **Arctic Circle** is an imaginary circle on the globe, parallel to the equator, and 23° 28′ distant from the north pole. This and its opposite, the **Antarctic**, are called the two polar circles.

**ARCTIC EXPEDITIONS.** *See* NORTH POLAR EXPEDITIONS.

**ARCTIC OCEAN.** That part of the water surface of the earth which surrounds the north pole, and washes the northern shores of Europe, Asia, and America; its southern boundary roughly coinciding with the Arctic Circle (lat. 66° 30′ N.). It encloses many large islands, and contains large bays and gulfs which deeply indent the northern shores of the three continents. Its great characteristic is ice, which is perpetual nearly everywhere.

**ARCTIC REGIONS.** The regions round the north pole, and extending from the pole on all sides to the Arctic Circle in lat. 66° 30′ N. The Arctic or North Polar Circle just touches the northern headlands of Iceland, cuts off the southern and narrowest portion of Greenland, crosses Fox's Strait north of Hudson's Bay, whence it goes over the American continent to Behring's Strait. Thence it runs to Obdorsk at the mouth of the Obi, then crossing Northern Russia, the White Sea, and the Scandinavian Peninsula, returns to Iceland. Though much skill and heroism have been displayed in the exploration of this portion of the earth, there is still an area round the pole estimated at 2,500,000 sq. miles, which is a blank to geographers. Many have adopted the belief in the existence of an open polar sea about the north pole. But this belief is not supported by any positive evidence. Valuable minerals, fossils etc., have been discovered within the Arctic regions. In the archipelago north of the American continent excellent coal frequently occurs. The mineral cryolite is mined in Greenland. Fossil ivory is obtained in islands at the mouth of the Lena. In Scandinavia, parts of Siberia, and north-west America, the forest region extends within the Arctic Circle. The most characteristic of the natives of the Arctic regions are the Esqimaux. The most notable animals are the white-bear, the musk-ox, the reindeer, and the whalebone whale. Fur-bearing animals are numerous. The most intense cold ever registered in those regions was 74° below zero F. The aurora borealis is a brilliant phenomenon of Arctic nights. *See* NORTH POLAR EXPEDITIONS.

**ARC'TIUM.** *See* BURDOCK.

**ARC'TOMYS.** *See* MARMOT.

**ARCTU'RUS, or ALPHA BOÖTIS.** A fixed star of the first magnitude in the constellation of Boötes (the Ploughman), is one of the brightest stars in the northern heavens, yellow in colour. Its light is believed to be intrinsically at least 140 times as brilliant as the sun's, and to take over 40 years to reach us. It is notable as having a comparatively large proper motion.

**ARDAHAN'.** A small fortified town about 6400 feet above the sea, between Kars and Batûm in Armenia. It was captured by the Russians in 1877, and ceded to them by the Berlin Treaty, 1878. It was handed over to Turkey by the Treaty of Brest-Litovsk in 1918, but the Turkish troops evacuated it after the armistice in 1918.

**AR'DEA.** The genus to which the heron belongs, type of the family Ardëidæ, which includes also cranes, storks, bitterns, etc.

**AR'DEBIL, or ARDABIL.** A Persian town, province of Azerbaijan, near the Karasu, a tributary of the Aras, about 40 miles from the Caspian, in an elevated and healthy situation; it has mineral springs and a considerable trade. Pop. 10,000,

**ARDÈCHE** (ar-dāsh). A department in the south of France (Languedoc), on the west side of the Rhone, taking its name from the River Ardèche, which rises within it, and falls into the Rhone after a course of 46 miles; area, 2144 sq. miles. It is generally of a mountainous character, and contains the culminating point of the Cevennes. Silk and wine are produced. Annonay is the principal town, but Privas is the capital. Pop. (1926), 289,263.

**ARDEN, FOREST OF.** A wood in Warwickshire. Shakespeare is supposed to have used it as a setting for *As You Like It*.

**ARDENNES** (ar-den'). An extensive tract of hilly land stretching over a large portion of the north-east of France and south-west of Belgium. Anciently the whole tract formed one immense forest (*Arduenna Silva* of Cæsar); but large portions are now occupied by cultivated fields and populous towns.

**ARDENNES** (ar-den'). A frontier department in the north-east of France; area, 2027 sq. miles, partly consisting of the Forest of Ardennes. There are extensive slate-quarries, numerous iron-works, and important manufactures of cloth, iron-ware, leather, glass, earthenware, etc. It was the scene of many battles during the European War (1914-8). Chief towns, Mézières (the capital), Rocroi and Sedan. Pop. (1926), 297,448.

**ARDNAMURCHAN** (-mur'han) **POINT.** The most westerly point

of the Island of Great Britain, in Argyllshire, having a lighthouse, 180 feet above sea-level, visible 18 to 20 miles off.

**AR'DOCH.** A parish in south Perthshire, celebrated for its Roman remains, one, a camp, being the most perfect existing in Scotland.

**ARDROSS'AN.** A seaport of Scotland, in Ayrshire, on the Firth of Clyde. It has a large harbour and shipbuilding yards, and is a centre of steamship services with Arran, Ireland, and Douglas, I.O.M. Pop. (1931), 6888.

**ARDS'LEY.** East and West, an urban district or town of England, W. Riding of Yorkshire, several miles north-west of Wakefield, with collieries, iron-mines, ironworks, etc. Pop. (1921), 7058.

**ARE** (ăr). The unit of the French land measure, equal to 100 sq. metres, or 1076·44 English sq. feet. A *hectare* is 100 ares, equal to 2·47 English acres. The tenth part of an are is called a *décaire*, and a hundredth part a *centiare*.

**A'REA.** The superficial content of any figure or space, the quantity of surface it contains in terms of any unit. *See* MENSURATION.

**ARE'CA.** A genus of lofty palms with pinnated leaves, and a drupe-like fruit enclosed in a fibrous rind. *A. Catĕchu* of the Coromandel and Malabar coasts is the common areca palm which yields areca or betel-nuts, and also the astringent juice catechu. *A. oleracĕa* is the cabbage tree or cabbage palm of the West Indies. With lime and the leaves of the betel-pepper, the areca-nuts when green form the celebrated masticatory of the East. They are an important article in Eastern trade.

**ARECIBO** (ä-rē-thā'bō). A seaport town on the north coast of the Island of Porto Rico. Pop. 9612.

**AREIOPAGUS.** *See* AREOPAGUS.

**ARE'NA.** The enclosed space in the central part of the Roman amphitheatres, in which took place the combats of gladiators or wild beasts. It was usually covered with sand or sawdust to prevent the gladiators from slipping, and to absorb the blood. *See* AMPHITHEATRE.

**ARENACEOUS ROCKS.** Include all sediments in which quartz sand is the most important constituent. Owing to its resistance to comminution and to chemical attack, quartz accumulates in sea-beaches while other mineral matter becomes removed. Hence sands gather near a shore and ultimately become consolidated by various natural cements into sandstones, those cemented by silica being styled quartzites. Sand-dunes in deserts or on coasts are unconsolidated arenaceous rock-masses.

**AR'ENDAL.** A seaport of Southern Norway, exporting timber, wood pulp, and iron, and owning numerous ships. It is a well-built place, having been rebuilt since the great fire of 1868. Wood pulp, paper, and cotton are manufactured. Pop. 11,000.

**ARENENBEPG CASTLE** (medi-æval, **NARRENBERG**). A castle and estate in the Swiss Canton Thurgau, the possession of Queen Hortense, who died there in 1837. In 1855 it became the property of the Empress Eugénie.

**ARENGA.** A term sometimes used as the generic name of the areng or gomuti palm, which is then botanically designated *Arenga saccharifera*. *See* GOMUTI.

**ARENIC'OLA.** *See* LOBWORM.

**ARE'OLAR TISSUE.** An assemblage of fibres in bundles, pervading almost every part of the animal structure, and connected with each other so as to form innumerable small cavities, the whole serving as a means by which the various organs and parts of organs are connected together. It is called also *Cellular Tissue* and *Connective Tissue*. The fibres are of two kinds—white fibrous tissue and yellow elastic fibrous tissue, and interspersed among the bundles or occupying the cellular cavities are cells and corpuscles of several kinds. It is a tissue found in large quantities under the skin, covering the muscles, the blood-vessels, and nerves, and in various parts forming a kind of protective covering for delicate and important organs. It is because of its general distribution, and because of its binding various structures together, that it is called *connective*.—In botany the term is sometimes applied to the *non*-vascular substance, composed entirely of untransformed cells, which forms the soft substance of plants.

**AREOM'ETER** (from Gr. *araios*, thin, *metron*, a measure). An instrument for measuring the specific gravity of liquids; a *hydrometer* (q.v.).

**AREOP'AGUS.** The oldest of the Athenian courts of justice, an assembly having a position more august than an ordinary court, and in its best days exercising a general supervision over public morals. It obtained its name from its place of meeting, on the Hill of Ares (Mars),

near the Acropolis or citadel of Athens. Another explanation connects the word with *Arcæ* (Curses), commonly known as *Semnæ* (Awful Goddesses), who were the guardians of the hill. It existed from very remote times, and the crimes tried before it were wilful murder, poisoning, robbery, and arson, while it had under its control also dissoluteness of morals, and innovations in the State and in religion. Its meetings were held in the open air, and its members were selected from those who had held the office of archon. The tribunal eventually lost many of its powers, but it continued to exist in name at least as late as the time of Cicero or later, having had an existence of seven or eight hundred years.

**AREQUIPA** (ä-rā-kē'pä). A city of Peru, capital of a province of same name, situated in a fertile valley, 7850 feet above sea-level, at a distance of about 55 miles from the coast and on the railway which runs from its port Mollendo inland to Puno on Lake Titicaca. Behind the city rises the volcano of Arequipa, or Peak of Misti (20,328 feet). The climate is healthy but the locality is liable to earthquakes, one of which almost completely destroyed the town in 1868, after which it was rapidly rebuilt. A considerable trade is carried on through Mollendo, there being a large transit trade with the interior, and the town carries on various industries, manufacturing cotton and woollen goods, etc. It was founded in 1540. Pop. 35,000 to 40,000.—The province has an area of 21,947 sq. miles, and a pop. of 229,007.

**ARES** (ā'rēz). *See* MARS.

**ARETHU'SA.** In Greek mythology, a daughter of Nereus and Doris, a nymph changed by Artēmis into a fountain in order to free her from the pursuit of the river-god Alpheus. This fountain was said to exist in the small island of Ortygia, near Syracuse, and was fabled to have a subterranean connection with the River Alpheus in Greece.

**ARETINO** (ä-rā-tē'nō). Guido. *See* GUIDO.

**ARETINO, Pietro.** Italian poet, born at Arezzo, 1492, died at Venice, 1556, the natural son of a nobleman called Luigi Bacci. He early displayed a talent for satirical poetry, and when still a young man was banished from Arezzo on account of a sonnet against indulgences. He went to Perugia, and thence to Rome (1517), where he secured the papal patronage, but subsequently lost it through writing licentious sonnets. Through the influence of the Medici family he found an opportunity to insinuate himself into the favour of Francis I. In 1527 Aretino went to Venice, where he acquired powerful friends, among them the Bishop of Vicenza. By his devotional writings he regained the favour of the Roman Court. He called himself "the divine," and "the scourge of princes," but he was also their abject flatterer, and that solely to obtain money. The obscenity of some of his writings was such that his name has become proverbial for licentiousness. Among them are five comedies and a tragedy.

**AREZZO** (ä-ret'sō; ancient **ARRETIUM**). A city of Central Italy capital of a province of the same name in Tuscany, near the confluence of the Chiana with the Arno. It has a noble cathedral, containing some fine pictures and monuments; remains of an ancient amphitheatre, etc. It was one of the twelve chief Etruscan towns, and in later times fought long against the Florentines, to whom it had finally to succumb. It is the birthplace of Mæcenas, Petrarch, Pietro Aretino, Redi, and Vasari. Pop. 51,862.—The province of Arezzo contains 1274 sq. miles, and 299,088 inhabitants (1915).

**AR'GAL, ARGOL,** or **TARTAR.** A hard crust formed on the sides of vessels in which wine has been kept, red or white according to the colour of the wine. It is an impure bitartrate of potassium.

**AR'GALI.** A species of wild sheep (*Caprōvis Argali* or *Ovis ammon*)

Argali (*Ovis ammon*)

found on the mountains of Siberia, Central Asia, and Kamtchatka. It is 4 feet high at the shoulders, and proportionately stout in its build, with horns nearly 4 feet in length measured along the curve, and at their base about 19 inches in circumference. It lives in small herds. This true argali must not be confounded with the North-African wild sheep, called the bearded argali and known as the arni, the Algerian mouffion, and the Barbary sheep.

**AR'GALL, Sir Samuel** (1572-1639). One of the early English adventurers to Virginia. He planned and executed the abduction of Pocahontas, the daughter of the Indian chief Powhattan, in order to secure the ransom of English prisoners. He was deputy-governor of Virginia (1617-9), and was accused of many acts of rapacity and tyranny. In 1620 he served in an expedition against Algiers, and was knighted by James I.

**AR'GAND LAMP.** A lamp named after its inventor, Aimé *Argand*, a Swiss chemist and physician (born 1755, died 1803), the distinctive feature of which is a burner forming a ring or hollow cylinder covered by a chimney, so that the flame receives a current of air both on the inside and on the outside.,

**ARGAUM** (ar-gä'um). A village of India, in Berar, celebrated for the victory of General Wellesley (Duke of Wellington) over the Mahrattas under Scindia and the Rajah of Berar, 29th Nov., 1803.

**AR'GELANDER, Friedrich Wilhelm August.** German astronomer, born in 1799. He added to the knowledge of the progressive motion of the solar system in space, and published a catalogue of 560 stars having "proper motion." His works include: *Atlas des nördlichen gestirnten Himmels* (1857), *Neue Uranometrie* (1843), etc. He died in 1875.

**ARGEMONE** (ar-jem'o-nē). A small genus of ornamental American plants of the poppy order. From the seeds of *A. mexicana* is obtained an oil very useful to painters. The handsomest species is *A. grandiflora*, which has large flowers of a pure white colour.

**ARGENSOLA** (ar-*h*en-sō'là), **Lupercio and Bartolomé Leonardo de.** Brothers, born at Barbastro, in Aragon, the former in 1565, died in 1613; the latter boru in 1566, died in 1631. Lupercio produced tragedies and lyric poems; Bartolomé a number of poems and a historical work, *The Conquest of the Moluccas*. Their writings are singularly alike in character, and are reckoned among the Spanish classics. The tragedies are of the heavy Senecan type, but the satirical writings of both brothers are full of pungent wit of a pleasing kind.

**ARGENSON** (ar-zhäṇ-sōṇ), **Marc Pierre de Voyer, Comte d'.** Celebrated French statesman, born in 1696, died 1764. After holding a number of subordinate offices he became minister for foreign affairs, and succeeded in bringing about the Congress of Breda, which was the prelude to that of Aix-la-Chapelle. He was present at the battle of Fontenoy, and was exiled to his estate for some years through the machinations of Madame Pompadour. His *Considérations sur le Gouvernement de la France* was a very advanced study on the possibility of combining with a monarchic form of government democratic principles and local self-government. *Les Essais, ou Loisirs d'un Ministre d'Etat*, published in 1785, is a collection of characters and anecdotes in the style of Montaigne.

**AR'GENT.** In coats of arms, the heraldic term expressing silver; represented in engraving by a plain white surface.

**ARGENTAN** (ar-zhäṇ-täṇ). A French town, department of Orne (Normandy), with an old castle and some manufactures. Pop. 6300.

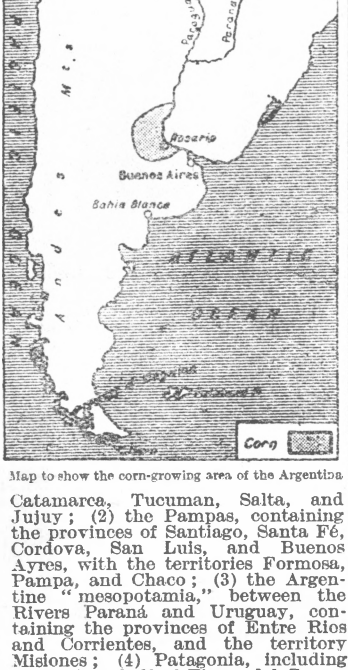
**ARGENTEUIL** (ar-zhäṇ-teu-yé). A town in France, department Seine-et-Oise, 7 miles below Paris; it has an active trade in wine, fruit, and vegetables. Pop. 24,282.

**ARGENTIE'RA,** or **KIMOLI** (ancient, **CIMLUS**). An island in the Grecian Archipelago, one of the Cyclades, about 18 miles in circumference, rocky and sterile. It produces a detergent chalk called *Cimolian earth* (q.v.), used in washing and bleaching. Pop. 1337.

**AR'GENTINE.** A silvery-white slaty variety of calc-spar, containing a little silica with laminæ usually undulated. It is found in primitive rocks and frequently in metallic veins.—Argentine is also the name of a small British fish (*Scopelus borealis*) less than 2 inches long and of a silvery colour.

**AR'GENTINE REPUBLIC.** Formerly the United Provinces of La Plata, a federal republic of South America, the extreme length of which is 2300 miles, and the average breadth a little over 500 miles, the total area 1,153,119 sq. miles. It consists of fourteen provinces, ten territories, and one federal district. It is bounded on the N. by Bolivia; on

the E. by Paraguay, Brazil, Uruguay, and the Atlantic; on the S. by the Antarctic Ocean; and on the W. by the Andes. It comprises four great natural divisions: (1) the Andine region, containing the provinces of Mendoza, San Juan, Rioja,




Map to show the corn-growing area of the Argentina

Catamarca, Tucuman, Salta, and Jujuy; (2) the Pampas, containing the provinces of Santiago, Santa Fé, Cordova, San Luis, and Buenos Ayres, with the territories Formosa, Pampa, and Chaco; (3) the Argentine "mesopotamia," between the Rivers Paraná and Uruguay, containing the provinces of Entre Rios and Corrientes, and the territory Misiones; (4) Patagonia, including the eastern half of Tierra del Fuego. With the exception of the N.W., where lateral branches of the Andes run into the plain for 150 or 200 miles, and the province of Entre Rios, which is hilly, the characteristic feature of the country is the great monotonous and level plains called "pampas."

In the north these plains are partly forest-covered, but all the central and southern parts present vast treeless tracts, which afford pasture to immense herds of horses, oxen, and sheep, and are varied in some places by brackish swamps, in others by salt steppes. The great watercourse of the country is the Paraná, having a length of fully 2000 miles from its source in the mountains of Goyaz, Brazil, to its junction with the Uruguay, where begins the estuary of La Plata. The Paraná is formed by the union of the Upper Paraná and Paraguay Rivers, near the N.E. corner of the State. Important tributaries are the Pilcomayo, the Vermejo, and the Salado. The Paraná, Paraguay, and Uruguay are valuable for internal navigation. Many of the streams which tend eastward terminate in marshes and salt lakes, some of which are rather extensive.

Not connected with the La Plata system are the Colorado and the Rio Negro, the latter formerly the southern boundary of the State, separating it from Patagonia. The source of the Negro is Lake Nahuel Huapi, in Patagonia (area, 1200 sq. miles), in the midst of magnificent scenery. The level portions of the country are mostly of tertiary formation, and the river and coast regions consist mainly of alluvial soil of great fertility. In the pampas clay have been found the fossil remains of extinct mammalia, some of them of colossal size.

**Vegetation.** European grains and fruits, including the vine, have been successfully introduced, and large areas are now under wheat, maize, flax, and other crops, another source of wealth consisting in the countless herds of cattle and horses and flocks of sheep, which are pastured on the pampas, and which multiply there very rapidly. Gold, silver, nickel, copper, tin, lead, and iron, besides marble, jasper, precious stones, and bitumen, are found in the mountainous districts of the N.W., while petroleum wells have been discovered on the Rio Vermejo; but the development of this mineral wealth has hitherto been greatly retarded by the want of proper means of transport. As a whole there are not extensive forests in the State except in the region of the Gran Chaco (which extends also into Bolivia), where there is known to be 60,000 sq. miles of timber. Thousands of square miles are covered with thistles, which grow to a great height in their season. Cacti also forms great thickets. Peach and apple trees are abundant in some districts. The native fauna includes the puma, the jaguar, the tapir, the llama, the alpaca, the vicuña, armadillos, the rhea or nandu, a species of ostrich, etc. The climate is agreeable and healthy, 97° being about the highest temperature experienced. The rainfall is very scanty in some districts, and is nowhere very large.

**Population.** As a whole this vast country is very thinly inhabited,

some parts of it as yet being very little known. The native Indians were never very numerous, and have given little trouble to the European settlers. Tribes of them yet in the savage state still inhabit the less-known districts, and live by hunting and fishing. Some of the Gran Chaco tribes are said to be very fierce, and European travellers have been killed by them. The European element is strong in the republic, more than half the population being Europeans or of pure European descent. Large numbers of immigrants arrive from Southern Europe, the Italians having the preponderance among those of foreign birth. The typical inhabitants of the pampas are the *Gauchos*, a race of half-breed cattle-rearers and horse-breakers; they are almost continually on horseback, galloping over the plains, collecting their herds and droves, taming wild horses, or catching and slaughtering cattle. In such occupations they require a marvellous dexterity in the use of the lasso and bolas.

The River La Plata was discovered in 1512 by the Spanish navigator Juan Diaz de Solis, and the La Plata territory had been brought into the possession of Spain by the end of the sixteenth century. In 1810 the territory cast off the Spanish rule, and in 1816 the independence of the United States of the Rio de la Plata was formerly declared, but it was long before a settled government was established. The present constitution dates from 1853, being modified in 1866 and 1898. The executive power is vested in a president—elected by the representatives of the fourteen provinces for a term of six years. A national congress of two chambers—a Senate and a House of Deputies—wields the legislative authority, and the republic is making rapid advances in social and political life. The national revenue for 1926 amounted to about £56,815,272, while the expenditure amounted to £56,250,985; the public debt was, at the end of 1927, about £178,000,000. There are about 23,000 miles of railway opened.

**Commerce.** The external commerce is important, the chief exports being beef and mutton, wheat, maize, and linseed, wool, skins and hides, tallow. The imports are chiefly manufactured goods. The trade is largely with Britain and France, and is increasing rapidly, the exports having advanced from £9,000,000 in 1876 and £73,200,000 in 1908 to £200,035,500 in 1927. The imports in 1927 were £169,962,300. The chief denomination of money is the dollar or *peso*, value (in gold) 4s. Buenos Ayres (or Aires) is the capital. Other towns are Rosario, Cordova, La Plata, Tucuman, Mendoza, and Santa-Fé. The population of the republic, which is rapidly increasing by immigration, was, in 1905, 5,678,197, and 10,348,189 in 1927; of the capital, 1,972,823 (1927).—BIBLIOGRAPHY: C. E. Akers *History of South America*, 1854 to 1904; W. H. Hudson, *The Naturalist in La Plata*; Keane and Markham, *Central and South America* (in Stanford's *Compendium of Geography and Travel*); Martinez and Lewandowski, *Argentine in the Twentieth Century*; Sir John Foster Fraser, *The Amazing Argentine*; H. Stephens, *Illustrated Descriptive Argentina*; *The Argentine Year Book*.

**AR'GENTITE.** Sulphide of silver, a blackish or lead-grey mineral, a valuable ore of silver found in the crystalline rocks of many countries.

**ARGENTOMETER.** *See* HYDROMETER.

**ARGILLACEOUS ROCKS.** Are rocks in which clay prevails (including shales and slates).

**ARGIVES** (ärʹjīvz), or **ARGIVI.** The inhabitants of Argos; used by Homer and other ancient authors as a generic appellation for all the Greeks.

**AR'GO.** *See* ARGONAUTS.

**ARGOL.** *See* ARGAL.

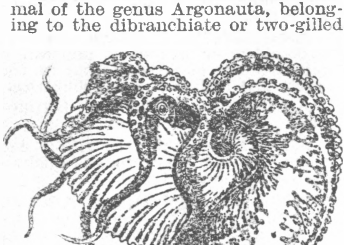
**ARGOLIS.** *See* ARGOS.

**ARGON.** A gas which is fairly widely distributed in the free state and is a constant constitutent of the atmosphere, of which it forms about 1 per cent by volume. It was discovered by Lord Rayleigh and Professor Ramsay in 1894. During their determinations of the density of nitrogen they noticed that the density of nitrogen derived from the air differed from the density of nitrogen derived from ammonia and other compounds of nitrogen, and after a series of very careful experiments they succeeded in isolating a new gas, which they named Argon. The gas occurs in sea and river water, in plants, in the blood of animals, and the gases issuing from volcanoes and mineral springs. It is always in the free state and never in combination, and is associated with nitrogen. It is colourless, odourless, and tasteless, and may be liquefied and solidified. It is heavier than air, and is chemically a very inert substance. It is usually referred to as one of the *rare* gases of the atmosphere.

Argon is manufactured in fairly large quantity from air, making use

of the inertness of the substance compared to oxygen and nitrogen, the chief constituents of the air. Several methods are in use, e.g. nitrogen may be removed by passing it repeatedly over red-hot magnesium; thus the nitrogen is absorbed and the argon left. When oxygen and nitrogen of air are absorbed by a mixture of 90 per cent calcium carbide and 10 per cent calcium cholride previously heated to redness *in vacuo*, a gas becoming richer and richer in argon is obtained. Another method of preparing argon is by fractionation of liquid air. It is used for filling electric bulbs.

**AR'GONAUT.** A molluscous animal of the genus Argonauta, belonging to the dibranchiate or two-gilled



Argonaut—Female

cuttle-fishes, distinguished by the females possessing a single-chambered external shell, not organically connected with the body of the animal. The males have no shell and are of much smaller size than the females. The shell is fragile, translucent, and boat-like in shape; it serves as the receptacle of the ova or eggs of the female, which sits in it with the respiratory tube or "funnel" turned towards the carina or "keel." This famed mollusc swims only by ejecting water from its funnel, and it can crawl in a reversed position, carrying its shell over its back like a snail. The account of its floating on the surface of the sea, with its sail-shaped arms extended to catch the breeze, and with the six other arms as oars, is a mere fable. The Argonaut, or *papernautilus*, must be carefully distinguished from the *pearly-nautilus* or nautilus proper (*Nautilus Pompilius*).

**ARGONAUTS.** In the legendary history of Greece, those heroes who performed a hazardous voyage to Colchis, a far-distant country at the eastern extremity of the Euxine (Black Sea), with Jason in the ship *Argo*, for the purpose of securing a golden fleece, which was preserved suspended upon a tree, and under the guardianship of a sleepless dragon. By the aid of Medea, daughter of the King of Colchis, Jason was enabled to seize the fleece, and, after many strange adventures, to reach his home at Iolcos in Thessaly. Among the Argonauts were Hercules, Castor and Pollux, Orpheus and Theseus.—BIBLIOGRAPHY: A. R. Hope Moncrieff, *Classic Myth and Legend*; Kingisey, *The Herocs*; N. Hawthorne, *The Wonder-book*.

**ARGO-NAVIS.** The southern constellation of the Ship, is almost entirely invisible in Britain. It contains Canopus, next to Sirius the brightest fixed star. In the great nebula in Argo is situated the remarkable star Eta Argus. It is variable, generally faint, but in 1837 it became temporarily one of the brightest stars in the sky.

**ARGONNE.** A district of France, between the Rivers Meuse, Marne, and Aisne, celebrated for the campaign of Dumouriez against the Prussians in 1792, and for the military movements and actions which took place therein previous to the battle of Sedan, in 1870.

**ARGONNE, Battle of.** When, in the autumn of 1914, the Allies retreated towards the Marne, the German Crown Prince's army endeavoured to invest Verdun. His right wing advanced through the thick and extensive forest of Argonne, but took precipitate flight after the battle of the Marne before the army of General Sarrail. In the summer of 1915 the Crown Prince endeavoured to hack his way through the French Argonne lines, using much heavy artillery, poison-gas, liquid-fire, and tear-shells. A final effort to break through was made in September, between Le Four de Paris and Vienne-le-Château, but, after gaining a footing in the first line of French trenches, the Germans were hurled back by a dashing counter-attack. The great salient from the Argonne to St. Mihiel was the salvation of Verdun.

**AR'GOS.** A town of Greece, in the north-east of the Peloponnesus, between the Gulfs of Ægina and Nauplia or Argos. This town and the surrounding territory of Argolis were famous from the legendary period of Greek history onwards. Here, besides Argos, was Mycenæ, where Agamemnon ruled. Modern Argos is a straggling place of 10,000 inhabitants, with some ancient remains. The territory Argolis forms a nomarchy of Greece. Pop., Argolis and

Corinthia, 163,455. The capital is Nauplia.

**ARGOS'TOLI.** A city of the Ionian Islands, capital of Cephalonia, and the residence of a Greek bishop. Pop. 14,000.

**AR'GOSY.** A poetical name for a large merchant-vessel; derived from *Ragusa*, a port which was formerly more celebrated than now, and whose vessels did a considerable trade with England. It is popularly but erroneously connected with the ship *Argo* in which Jason sailed. *See* ARGONAUTS.

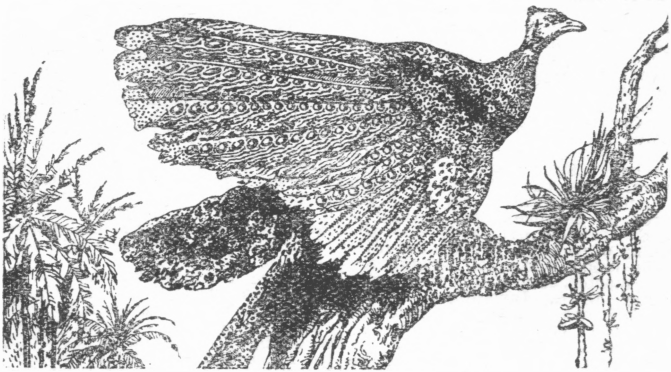
**ARGOT** (Fr.; ar-gō). The jargon, slang, or peculiar phraseology of a class or profession; originally the conventional slang of thieves and vagabonds, invented for the purpose of disguise and concealment. Some of François Villon's poems are written in argot.—Cf. W. von Knoblauch, *Dictionary of Argot*.

**ARGUIM,** or **ARGUIN** (ar-gwim', ar-gwin'). A small island on the west coast of Africa, not far from Cape Blanco, formerly a centre of trade. Its possession was violently disputed between the Portuguese, Dutch, English, and French.

**AR'GUMENT.** A term sometimes used as synonymous with the *subject* of a discourse, but more frequently appropriated to any kind of method employed for the purpose of confuting or at least silencing an opponent. Logicians have reduced arguments to a number of distinct heads, such as the *argumentum ad judicium*, which founds on solid proofs and addresses to the judgment; the *argumentum ad verecundiam*, which appeals to the modesty or bashfulness of an opponent by reminding him of the great names or authorities by whom the view disputed by him is supported; the *argumentum ad ignorantiam*, the employment of some logical fallacy towards persons likely to be deceived by it; and the *argumentum ad hominem*, an argument which presses a man with consequences drawn from his own principles and concessions, or his own conduct. *See* FALLACY, LOGIC.

**ARGUMENT OF THE PEOPLE.** The document set forth by the Council of the Army on 15th Jan., 1649, fifteen days before the execution of King Charles I. *See* LEVELLERS.

**AR'GUS.** In Greek mythology, a fabulous being, said to have had a hundred eyes, placed by Juno to guard Io. Hence "argus-eyed," applied to one who is exceedingly watchful.



Argus-pheasant (*Argus gigantēus*)

**ARGUS-PHEASANT** (*Argus gigantēus*). A large, beautiful, and very singular species of pheasant, found native in the south-east of Asia, more especially in Sumatra and some of the other islands. The males measure from 5 to 6 feet from the tip of the beak to the extremity of the tail, which has two greatly-elongated central feathers. The plumage is exceedingly beautiful, the secondary quills of the wings, which are longer than the primary feathers, being each adorned with a series of ocellated or eye-like spots (whence the name—*see* ARGUS) of brilliant metallic hues. The general body plumage is brown.

**ARGYLL,** or **ARGYLE** (ar-gil'). An extensive county in the south-west of the Highlands of Scotland, consisting partly of mainland and partly

of islands belonging to the Hebrides group, the chief of which are Islay, Mull, Jura, Tiree, Coll, Luing, Lismore, and Colonsay, with Iona and Staffa. On the land side the mainland is bounded north by Inverness; east by Perth and Dumbarton; elsewhere surrounded by the Firth of Clyde and its connections and the sea; area, 3213 sq. miles (or over 2,000,000 acres), of which the islands comprise about 625 sq. miles. It is greatly indented by arms of the sea, which penetrate far inland, the most important of these being Loch Sunart, Loch Linnhe (the extremities of which are Loch Eil and Loch Leven), Loch Etive, Loch Fyne, Loch Tarbert, Loch Riddon, Loch Striven, and Loch Long.

The mainland is divided into six districts of Northern Argyle, Lorn, Argyle, Cowal, Knapdale, and Kintyre; the two first being sub-divided into the sub-districts of Lochiel, Ardgour, Sunart, Ardnamurchan, Morven, and Appin. The county is exceedingly mountainous, the chief summits being Bidean-nam-Bian (3766 feet), Ben Laoigh (3708 feet), Ben Cruachan (3611 feet), Benmore, in Mull (3185 feet), the Paps of Jura (2565 feet), and Ben Arthur or the Cobbler (2891 feet). There are several lakes, the principal of which is Loch Awe. Cattle and sheep are reared in numbers, and fishing is largely carried on, as is also the making of whisky. There is but little arable land. The chief minerals are slate, marble, limestone, and granite. County town, Inveraray; others, Campbeltown, Oban, and Dunoon. Pop. (1931), 63,014.

**ARGYLL, CAMPBELLS OF.** A historic Scottish family, raised to the peerage in the person of Sir Duncan Campbell of Lochow, in 1445. The more eminent members are: Archibald, 2nd Earl, killed at the battle of Flodden, 1513.—Archibald, 5th Earl, attached himself to the party of Mary of Guise, and was the means of averting a collision between the Reformers and the French troops in 1559; was commissioner of regency after Mary's adbication, but afterwards commanded her troops at the battle of Langside: died 1575. Archibald, 8th Earl and 1st Marquess, born 1598: a zealous partisan of the Covenanters; created a marquess by Charles I. It was by his persuasion that Charles II. visited Scotland, and was crowned at Scone in 1651. At the Restoration he was committed to the Tower, and afterwards sent to Scotland, where he was tried for high treason, and beheaded in 1661.

Archibald, 9th Earl, son of the preceding, served the king with great bravery at the battle of Dunbar, and was excluded from the general pardon by Cromwell in 1654. On the passing of the Test Act in 1681 he refused to take the required oath except with a reservation. For this he was tried and sentenced to death. He managed to escape to Holland, from whence he returned with a view of aiding the Duke of Monmouth. His plan, however, failed, and he was taken and conveyed to Edinburgh, where he was beheaded in 1685.

Archibald, 10th Earl and 1st Duke, son of the preceding, died 1703; took an active part in the Revolution of 1688-9, which placed William and Mary on the throne, and was rewarded by several important appointments and the title of duke.—John, 2nd Duke and Duke of Greenwich, son of the above, born 1678, died 1743; served under Marlborough at the battles of Ramillies, Oudenarde, and Malplaquet, and assisted at the sieges of Lille and Ghent. He incurred considerable odium in his own country for his efforts in promoting the union. In 1712 he had the military command in Scotland, and in 1715 he fought an indecisive battle with the Earl of Mar's army at Sheriffmuir, near Dunblane, and forced the Pretender to quit the kingdom. He was long a supporter of Walpole, but his political career was full of intrigue. He is the Duke of Argyll in Scott's *Heart of Midlothian*.

George Douglas Campbell, K.G., K.T., etc., 8th Duke (of United Kingdom, 1892), was born in 1823. He early took a part in politics, especially in discussions regarding the Presbyterian Church of Scotland. In 1852 he became Lord Privy Seal under Lord Aberdeen, and again under Lord Palmerston in 1859; Postmaster-General in 1860; Secretary for India from 1868 to 1874; again Lord Privy Seal in 1880, but retired, being unable to agree with his colleagues on their Irish policy. He died in 1900. He wrote *The Reign of Law*, *Scotland as it was and as it is*, etc.

John Douglas Sutherland Campbell, 9th Duke of, son of the 8th Duke and a daughter of the 2nd Duke of Sutherland, was born in 1845, and succeeded his father in 1900. He completed his education at Trinity College, Cambridge, sat in Parliament as member for Argyllshire, 1868-78, was Governor-General of Canada from 1878 to 1883, and again sat in Parliament as member for South Manchester from 1895 to 1900, as a Liberal-Unionist. He married the Princess Louise of Great

Britain, fourth daughter of Queen Victoria, in 1871. He died in 1914.

His works include: *The United States after the War, Imperial Federation, Canadian Pictures, Memories of Canada and Scotland, Life of Lord Palmerston, Tales and Poems, The Psalms in English Verse, Life and Times of Queen Victoria, Yesterday and To-day in Canada*, etc.

**ARGYLL AND SUTHERLAND HIGHLANDERS** (Princess Louise's). Raised by the 5th Duke of Argyll (1794), received their present title in 1872. The regiment served under Sir David Baird in Cape Colony, and at Balaklava made itself immortal as Sir Colin Campbell's "thin red line." It was further distinguished in the European War at Gheluvelt, Le Cateau, and the second battle of Ypres.

**ARGYROKASTRON** (ár'gi-rō-). A town in Albania, 40 miles north-west of Janina; built on three ridges intersected by deep ravines, across which are several bridges. It was occupied by the Greeks in 1916. Pop. about 10,000.

**ARGYROPU'LOS, Johannes.** One of the principal revivers of Greek learning in the fifteenth century. Born in Constantinople 1415, died at Rome, 1486.

**ARIA.** In music. *See* AIR.

**ARIADNE** (a-ri-ad'ne). In Greek mythology, a daughter of Minos, King of Crete. She gave Theseus a clue of thread to conduct him out of the labyrinth after his defeat of the Minotaur. Theseus abandoned her on the Isle of Naxos, where she was found by Dionysus, who married her.

**ARIA'NA.** The ancient name of a large district in Asia, forming a portion of the Persian Empire; bounded on the north by the provinces of Bactriana, Margiana, and Hyrcania; east by the Indus; south by the Indian Ocean and the Persian Gulf; west by Media.

**ARIANO** (ä-rē-ä'nō). A town in South Italy, province of Avellino, 44 miles north-east of Naples, the seat of a bishop, with a handsome cathedral. Pop. 10,000.

**AR'IANS.** The adherents of the Alexandrian presbyter Arius, who, about A.D. 318, promulgated the doctrine that Christ was a created being inferior to God the Father in nature and dignity, though the first and noblest of all created beings; and also that the Holy Spirit is not God, but created by the power of the Son. Arianism has been defined as an attempt to determine the relations of the Persons of the Trinity on a basis of distinction and subordination. It does not seem to have sprung from any strong ethical impulse; its philosophy was pagan, and the object of the leaders political rather than religious. The doctrines were condemned by the Council of Nicæa in 325. Arius died in 336, and after his death his party gained considerable accessions, including several emperors, and for a time held a strong position.

Since the middle of the seventh century, however, the Arians have nowhere constituted a distinct sect, although similar opinions have been advanced by various theologians in modern times. The Arian controversy was revived in England during the eighteenth century by Willian Whiston and Dr. Samuel Clarke.—BIBLIOGRAPHY: H. M. Gwatkin, *Studies of Arianism*; J. H. Newman, *Arians of the Fourth Century*; J. H. Colligan, *Arian Movement in England*.

**ARICA** (ä-rē'kä). A seaport of Chile, 30 miles S. of Tacna; previous to 1880 it belonged to Peru. It has suffered frequently from earthquakes, being in 1868 almost entirely destroyed, part of it being also submerged by an earthquake wave. Pop. about 9000. For Chilian province of Arica, *see* TACNA.

**ARICHAT** (-shat'). A seaport town and fishing station of Nova Scotia, on a small bay, south coast of Madame Island. Pop. about 2500.

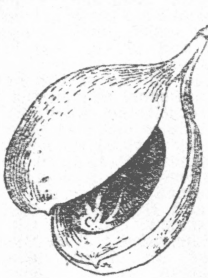
**ARIÈGE** (ä-rē-äzh). A mountainous department of France, on the northern slopes of the Pyrenees, comprising the ancient countship of Foix and parts of Languedoc and Gascony. The principal rivers are the Ariège, Arize, and Salat, tributaries of the Garonne. Sheep and cattle are reared; the arable land is small in quantity. Chief town, Foix. Area, 1892 sq. miles. Pop. (1926), 167,498.

**A'RIEL.** A symbolic name for Jerusalem in the Old Testament; in the demonology of the later Jews a spirit of the waters. In Shakespeare's *Tempest*, Ariel was the "tricksy spirit" whom Prospero had in his service.

**ARIES** (ā'ri-ēz; Lat.). The Ram, a northern constellation. It is the first of the twelve signs of the zodiac, which the sun enters at the vernal equinox, about the 21st of March. The "First Point in Aries" is where the equator cuts the ecliptic in the ascending node, from which point the right ascensions of heavenly bodies are reckoned on the equator, and their longitudes upon the ecliptic. Owing to the precession of

the equinoxes the sign Aries no longer corresponds with the constellation Aries, which it did 2000 years ago.

**AR'IL, or ARIL'LUS.** In some plants, as in the nutmeg, an extra covering of the seed, outside of the



Aril, fruit of Nutmeg

true seed-coats, proceeding from the placenta, partially investing the seed, and falling off spontaneously. It is either succulent or cartilaginous, coloured, elastic, rough, or knotted. In the nutmeg it is known as *mace*.

**ARIMAS'PIANS.** In ancient Greek traditions, a people who lived in the extreme north-east of the ancient world. They were said to be one-eyed and to carry on a perpetual war with the gold-guarding griffins, whose gold they endeavoured to steal. Cf. Milton, *Paradise Lost*, II., 943.

**ARIMATHÆA.** A town of Palestine, identified with the modern *Ramleh*, 22 miles W.N.W. of Jerusalem.

**ARI'ON.** An ancient Greek poet and musician, born at Methymna, in Lesbos, flourished about 625 B.C. He lived at the Court of Periander of Corinth, and afterwards visited Sicily and Italy. Returning from Tarentum to Corinth with rich treasures, the avaricious sailors resolved to murder him. Apollo, however, having informed him in a dream of the impending danger, Arion in vain endeavoured to soften the hearts of the crew by the power of music. He then threw himself into the sea, when one of a shoal of dolphins, which had been attracted by his music, received him on his back and bore him to land. The sailors, having returned to Corinth, were confronted by Arion and convicted of their crime. The lyre of Arion, and the dolphin which rescued him, became constellations in the heavens. A fragment of a hymn to Poseidon, ascribed to Arion, is extant.

**ARIOS'TO, Ludovi'co.** One of the most celebrated poets of Italy, was born at Reggio, in Lombardy, 8th Sept., 1474, of a noble family; died 6th June, 1533. His lyric poems in the Italian and Latin languages, distinguished for ease and elegance of style, introduced him to the notice of the Cardinal Ippolito d'Este, son of Duke Ercole I. of Ferrara. In 1503 Ippolito employed him in his service and used his counsel in the most important affairs. In this service he began and finished, in ten or eleven years, his immortal poem, the *Orlando Furioso*, which was published in 1515, and immediately became highly popular. He afterwards entered the service of Alfonso I., Duke of Ferrara, the cardinal's brother, a lover of the arts, who put much confidence in him.

After quelling disturbances that had broken out in the wild and mountainous Garfagnana, he returned to Ferrara, where he employed himself in the composition of his comedies, and in putting the last touches to his *Orlando*. The *Orlando Furioso* is a continuation of the *Orlando Innamorato* of Bojardo, details the chivalrous adventures of the paladins of the age of Charlemagne, and extends to forty-six cantos. The best English translation is that of Rose (1823). Cf. E. Gardner, *Ariosto: the Prince of Court Poets*; J. S. Nicholson, *Life and Genius of Ariosto*.

**ARISH.** *See* EL ARISH.

**ARISTÆUS.** In Greek mythology, son of Apollo and Cyrene, the introducer of bee-keeping. Cf. Virgil, *Georgics*, IV., 315-558.

**ARISTARCHUS** (a-ris-tär'kus). An ancient Greek grammarian, born at Samothrace, 220 B.C., died at Cyprus, 143 B.C. He edited Homer's poems with the greatest acuteness and ability, endeavouring to restore the text to its genuine state, and to clear it of all interpolations and corruptions; hence the phrase, Aristarchian criticism. His edition of Homer furnished the basis of all subsequent ones.

**ARISTARCHUS.** An ancient Greek astronomer belonging to Samos, flourished about 155 B.C., and first asserted the revolution of the earth about the sun; also regarded as the inventor of the sun-dial.

**ARIS'TÆAS.** A personage of ancient Greek legend, represented to have lived over many centuries, disappearing and reappearing by turns.

**ARISTIDES** (a-ris-ti'dēz). A statesman of ancient Greece, for his strict

integrity surnamed the *Just*. He was one of the ten generals of the Athenians when they fought with the Persians at Marathon, 490 B.C. Next year he was eponymous archon, and in this office enjoyed such popularity that he excited the jealousy of Themistocles, who succeeded in procuring his banishment by ostracism (about 483).

Three years after, when Xerxes invaded Greece with a large army, the Athenians hastened to recall him, and Themistocles now admitted him to his confidence and councils. In the battle of Platæa (479) he commanded the Athenians, and had a great share in gaining the victory. To defray the expenses of the Persian war he persuaded the Greeks to impose a tax, which should be paid into the hands of an officer appointed by the States collectively, and deposited at Delos. The confidence which was felt in his integrity appeared in their entrusting him with the office of apportioning the contribution. He died at an advanced age about 468 B.C., so poor that he was buried at the public expense.

**ARISTIP'PUS** (*c.* 425-366 B.C.). A disciple of Socrates, and founder of a philosophical school among the Greeks, which was called the *Cyrenaic*, from his native city Cyrênê, in Africa; flourished 380 B.C. His moral philosophy differed widely from that of Socrates, and was a science of refined voluptuousness. His fundamental principles were—that all human sensations may be reduced to two, pleasure and pain. Pleasure is a gentle, and pain a violent emotion. All living beings seek the former and avoid the latter. Happiness is nothing but a continued pleasure, composed of separate gratifications; and as it is the object of all human exertions, we should abstain from no kind of pleasure. Still we should always be governed by taste and reason in our enjoyments.

His doctrines were taught only by his daughter Arêtê, and by his grandson Aristippus the younger, by whom they were systematized. Other Cyrenaics compounded them into a particular doctrine of pleasure, and are hence called *Hedonici*. His writings are lost.

**ARISTOC'RACY** (Gr. *aristos*, best. *kratos*, rule). A form of government by which the wealthy and noble, or any small privileged class, rules over the rest of the citizens. The term has now become almost entirely social in meaning, and is mostly applied to the nobility or chief persons in a State.

**ARISTOGEITON** (-gi'ton). A citizen of Athens, whose name is rendered famous by a conspiracy (514 B.C.) formed in conjunction with his friend Harmodius against the tyrants Hippias and Hipparchus, the sons of Pisistratus. Both Aristogeiton and Harmodius lost their lives through their attempts to free the country, and were reckoned martyrs of liberty.

**ARISTOLOCHIA** (-lō'ki-a). A genus of plants, the type of the ord. Aristolochiaceæ, which consists of dicotyledonous monochlamydeous plants, with an inferior 3-6-celled fruit, found for the most part in the hotter parts of the world, and in many cases used medicinally on account of their tonic and stimulating properties. The genus has emmenagogic qualities, especially the European species *A. rotunda*, *A. longa*, and *A. Clematitis*. *A. bracteâta* is used in India as an anthelminthic; *A. odoratissima*, a West Indian species, is a valuable bitter and alexipharmic. *A. serpentaria* is the Virginian snake-root, popularly regarded as a remedy for snake bites.

**ARISTOPHANES** (-tof'a-nēz). The greatest comic poet of ancient Greece, born at Athens probably about the year 455 B.C., died 375 B.C. Little is known of his life. He appeared as a poet in 427 B.C., and having indulged in some sarcasms on the powerful demagogue Cleon, was ineffectually accused by the latter of having unlawfully assumed the title of an Athenian citizen. He afterwards revenged himself on Cleon in his comedy of the *Knights*, in which he himself acted the part of Cleon, because no actor had the courage to do it.

Of fifty-four (or forty-four) comedies attributed to him, eleven only remain; believed to be the flower of the ancient comedy, and distinguished by wit, humour, and poetry, as also by grossness. In them there is constant reference to the manners, actions, and public characters of the day, the freedom of the old Greek comedy allowing an unbounded degree of personal and political satire. The names of his extant plays are *Acharnians*, *Knights*, *Clouds*, *Wasps*, *Peace*, *Birds*, *Lysistrata*, *Thesmophoriazusæ*, *Frogs*, *Ecclesiasuzæ*, and *Plutus*. — BIBLIOGRAPHY: B. B. Rogers, *Complete Works of Aristophanes, with verse translation* (by far the best translation); Hookham-Frere, *Translation* (five plays only); Couat, *Aristophane et l'ancienne comédie attique*.

**AR'ISTOTLE** (Gr. *Aristot'eles*). A distinguished philosopher and natur-

alist of ancient Greece, the founder of the Peripatetic school of philosophy, was born in 384 B.C. at Stagira, in Macedonia; died at Chalcis, 322 B.C. His father, Nicomachus, was physician to Amyntas II., King of Macedonia, and claimed to be descended from Æsculapius. Aristotle had lost his parents before he came, at about the age of seventeen, to Athens to study in the school of Plato. With that philosopher he remained for twenty years, became pre-eminent among his pupils, and was known as the "Intellect of the School."

Upon the death of Plato, 348 B.C., he took up his residence at Atarneus, in Mysia, on the invitation of his former pupil Hermeias, the ruler of that city, on whose assassination by the Persians, 343 B.C., he fled to Mitylene with his wife Pythias, a near relative of Hermeias. During his residence at Mitylene he received an invitation from Philip of Macedon to superintend the education of his son Alexander, then in his fourteenth year. This relationship between the great philosopher and the future conqueror continued for five or six years, during which the prince was instructed in grammar, rhetoric, poetry, logic, ethics, and politics, and in those branches of physics which had even then made some considerable progress. On Alexander succeeding to the throne Aristotle continued to live with him as his friend and councillor till he set out on his Asiatic campaign (334 B.C.).

He returned to Athens and established his school in the Lyceum, a gymnasium attached to the temple of Apollo Lyceius, which was assigned to him by the State. He delivered his lectures in the wooded walks of the Lyceum while walking up and down with his pupils. From the action itself, or more probably from the name of the walks (*peripatoi*), his school was called Peripatetic. Pupils gathered to him from all parts of Greece, and his school became by far the most popular in Athens. The statement that he had two circles of pupils, the *exoteric* and the *esoteric* has given rise to much controversy. By some it has been held that Aristotle published during his lifetime popular discourses with a view to make way for his doctrines in Athenian society, then impregnated with Platonic theories, and that these are called exoteric in contradistinction to those in which are embodied his matured opinions.

It was during the time of his teaching at Athens that Aristotle is believed to have composed the great bulk of his works. But it is not possible to speak with any certainty about the chronology of his writings, as the references may be additions of editors. On the death of Alexander a revolution occurred in Athens hostile to the Macedonian interests with which Aristotle was identified. He therefore retired to Chaclis, where he soon after died. Sir Charles Walston, in 1891, opened a tomb near Eretria which he supposed to be that of Aristotle. According to Strabo he bequeathed all his works to Theophrastus, who, with other disciples of Aristotle, amended and continued them. They afterwards passed through various hands, till, about 50 B.C., Andronicus of Rhodes put the various fragments together and classified them according to a systematic arrangement.

Many of the books bearing his name are spurious, others are of doubtful genuineness. The whole are generally divided into logical, theoretical, and practical. The logical works are comprehended under the title *Organon* (Instrument). The theoretical are divided into physics, mathematics, and metaphysics. The physical works (including those on natural history) are on the *General Principles of Physical Science, The Heavens, Generation and Destruction, Meteorology, Natural History of Animals, On the Paris of Animals, On the Generation of Animals, On the Locomotion of Animals, On the Soul, On Memory, Sleep and Waking, Dreams, Divination.* In mathematics there are two treatises, *On Indivisible Lines* and *Mechanical Problems. The Metaphysics* consist of fourteen books; the title (*Ta meta ta Physika,* "the things following the Physics,") is the invention of an editor. The practical works embrace ethics, politics, economics, and treatises on art, and comprise the *Nicomachæan Ethics* (so called because dedicated to his son, Nicomachus), *The Politics, Œconomics, Poetry,* and *Rhetoric.*

Among the lost works are the dialogues and others termed exoteric. A treatise *On the Constitution of Athens* was discovered in 1891. His style is devoid of grace and elegance. His works were first printed in a Latin translation, with the commentaries of Averroes, at Venice in 1489; the first Greek edition was that of Aldus Manutius (5 vols., 1495-8). *See* PERIPATETIC PHILOSOPHY.—BIBLIOGRAPHY: Blakesley, *Life of Aristotle*; S. H. Butcher, *Poetics* (with translation and excursus); R. Shute, *History of the Aristotelian Writings*; J. C. Wilson, *Aristotelian Studies*; E. Zeller, *Aris-*

*lotle and the Earlier Peripatetics*; E. Barker, *Political Thought of Plato and Aristotle.*

**ARISTOX'ENUS.** An ancient Greek musician, and philosopher of Tarentum, born about 324 B.C. He studied music under his father Mnesias, and philosophy under Aristotle, whose successor he aspired to be. He endeavoured to apply his musical knowledge to philosophy, and especially to the science of mind, but it only appears to have furnished him with far-fetched analogies and led him into a kind of materialism. We have a work on the *Elements of Harmony* by him.

**ARITH'METIC** (Gr. *arithmos*, number). Is primarily the science of numbers. As opposed to algebra it is the practical part of the science. Although the processes of arithmetical operations are often highly complicated, they all resolve themselves into the repetition of four primary operations—addition, subtraction, multiplication, and division. Of these the two latter are only complex forms of the two former, and subtraction again is merely a reversal of the process of addition. Little or nothing is known as to the origin and invention of arithmetic. Some elementary conception of it is in all probability coeval with the first dawn of human intelligence. In consequence of their rude methods of numeration the science made but small advance among the ancient Egyptians, Greeks, and Romans, and it was not until the introduction of the decimal scale of notation and the Arabic, or rather Indian, numerals into Europe that any great progress can be traced.

In this scale of notation every number is expressed by means of the ten digits, 1, 2, 3, 4, 5, 6, 7, 8, 9, 0, by giving each digit a local as well as its proper or natural value. The value of every digit increases in a tenfold proportion from the right towards the left; the distance of any figure from the right indicating the power of 10, and the digit itself the number of those powers intended to be expressed: thus $3464 = 3000 + 400 + 60 + 4 = 3 \times 10^3 + 4 \times 10^2 + 6 \times 10 + 4$. The earliest arithmetical signs appear to have been hieroglyphical, but the Egyptian hieroglyphics were too diffuse to be of any arithmetical value. The units were successive strokes to the number required, the ten an open circle, the hundred a curled palm-leaf, the thousand a lotus flower, ten thousand a bent finger.

The letters of the alphabet afforded a convenient mode of representing figures, and were used accordingly by the Chaldeans, Hebrews, and Greeks. The first nine letters of the Hebrew alphabet represented the units, the second nine tens, the remaining four together with five repeated with additional marks, hundreds: the same succession of letters with added points was repeated for thousands, tens of thousands, and hundreds of thousands. The Greeks followed the same system up to tens of thousands. They wrote the different classes of numbers in succession as we do, and they transferred operations performed on units to numbers in higher places; but the use of different signs for the different ranks clearly shows a want of full perception of the value of place as such. They adopted the letter M as a sign for 10,000 and by combining this mark with their other numerals they could note numbers as high as 100,000,000.

The Roman numerals, which are still used in marking dates or numbering chapters, were almost useless for purposes of computation. From one to four were represented by vertical strokes I, II, III, IIII, five by V, ten by X, fifty by L, one hundred by C, afterwards C, five hundred by D, a thousand by M. These signs were derived from each other according to particular rules, thus V was the half of X, Λ being also used: L was likewise the half of C. M was artistically written M and CIↃ, and IↃ, afterwards D, became five hundred. CCI represented 5000. CCIↃↃ 10,000, IↃↃↃ 50,000, CCCIↃↃↃ 100,000. They were also compounded by addition and subtraction, thus IV stood for four, VI for six, XXX for thirty, XL for forty, LX for sixty. Arithmetic is divided into *abstract* and *practical*: the former comprehends notation, numeration, addition, subtraction, multiplication, division, measures and multiples, fractions, powers and roots; the latter treats of the combinations and practical applications of these and the so-called rules, such as reduction, compound addition, subtraction, multiplication, and division, proportion, interest, profit and loss, etc.

Another division is *integral* and *fractional* arithmetic, the former treating of integers, or whole numbers, and the latter of fractions. Decimal fractions were invented in the sixteenth century, and logarithms, embodying the last great advance in the science, in the seventeenth century.

**ARITHMET'ICAL.** Pertaining to arithmetic or its operations.—*Arithmetical mean*, the middle term of three quantities in arithmetical progression, or half the sum of any two

proposed numbers; thus 11 is the arithmetical mean to 8 and 14—*Arithmetical progression*, a series of numbers increasing or decreasing by a common difference, as 1, 3, 5, 7, etc.

**Arithmetical signs**, certain symbols used in arithmetic, and indicating processes or facts. The common signs used in arithmetic are the following: × signifying that the numbers between which it is placed are to be added; − that the second is to be subtracted from the first; + that the one is to be multiplied by the other; ÷ that the former is to be divided by the latter; = signifies that the one number is equal to the other; : :: : are the signs placed between the members of a proportional series, as 4 : 6 :: 8 : 12. A small figure placed on the right hand of another at the top signifies the corresponding power of the number beside which it is placed, as $5^2$, $4^3$, meaning the square of 5 and the cube of 4. √ placed before or over a number signifies the square root of that number; with a figure it signifies the root of a higher power, as √, which means cube root. A period placed to the left of a series of figures indicates that they are decimal fractions.

**A'RIUS.** The originator of the Arian heresy. *See* ARIANS.

**ARIZO'NA.** A former territory of the United States, admitted into the union as a sovereign State on 14th Feb., 1912, is bounded south by Mexico, west by California and Nevada (the River Colorado forming the greater part of the boundary), north by Utah, and east by New Mexico; area, 113,956 sq. miles. The surface is generally mountainous, but many fertile and well-watered valleys lie between the ridges. Part of the surface consists of deserts often entirely destitute of vegetation. The territory belongs to the basin of the Colorado, which passes through a portion of it, besides forming the boundary; while the Gila and Little Colorado, tributaries of the Colorado, traverse it from east to west. The canyons of the Colorado form a wonderful feature, the river flowing for hundreds of miles in a deep rocky channel with walls rising perpendicularly to the height of 1500 to 6000 feet.

In some parts timber is plentiful. The rainfall is small, and irrigation has been employed for agricultural purposes. Large tracts of elevated land have been found excellently adapted as pastures for sheep and cattle. The territory is rich in copper, gold, silver, lead, and other minerals, and mining is largely carried on, with much copper smelting and refining. The capital is Phœnix. Pop. 40,000. The Southern and the Santa Fé Pacific Railways traverse it. Pop. (1920) 334,162 (of which 326,157 are white), exclusive of Apaches and other Indians on reservations (area, 33,891 sq. miles). Pop. (1931), 435,573.

**ARJISH DAGH.** The loftiest peak of the peninsula of Asia Minor, at the western extremity of the Anti-Taurus Range, 13,150 feet; an extinct volcano; on the N. and N.E. slopes are extensive glaciers.

**ARK.** The name applied in our translation of the Bible to the boat or floating house in which Noah resided during the flood or deluge; to the floating vessel of bulrushes in

Ark of the Covenant

which the infant Moses was laid; and to the chest in which the tables of the law were preserved—the *ark of the covenant*. This last was made of shittim-wood, overlaid within and without with gold, about 3¾ feet long by 2¼ feet high and broad, and over it were placed the golden covering or mercy-seat and the two cherubim. It was placed in the sanctuary of the temple of Solomon; before his time it was kept in the tabernacle, and was moved about as circumstances dictated. At the captivity it appears to have been either lost or destroyed.

**ARKANSAS** (ar'kan-sa or ar-kan'-sas). One of the United States of America, bounded north by Missouri; east by the Mississippi, which separates it from the States of Mississippi and Tennessee; south by Louisiana and Texas; and west by the Indian Territory and Texas; area, 53,335 sq. miles. The surface in the east is low, flat and swampy,

densely wooded, and subject to frequent inundations from the numerous streams which water it. Towards the centre it becomes more diversified, presenting many undulating slopes and hills of moderate elevation. In the west it rises still higher, being traversed by a range of hills called the Ozark, which attains a height of 2000 feet, some peaks rising to 3000. In various parts the prairies are of great extent; the forests also are extensive, principally of oak, hickory, ash, cotton, linden, maple, locust, and pine. Coal and other minerals are worked.

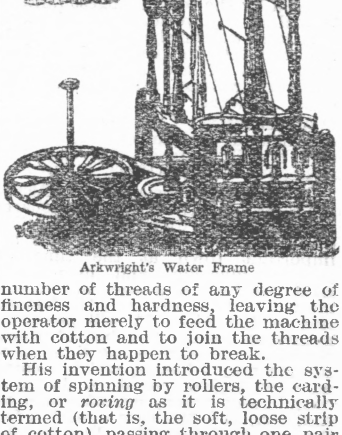
The principal rivers, all tributaries of the Mississippi, are the Arkansas, the Red River, the St. Francis, and the Washita. Near the centre of the State are warm springs, much resorted to for chronic rheumatic and paralytic affections. The climate is subject to great extremes of heat and cold, and in the lower districts is unhealthy to new settlers. The staple products are cotton and maize; fruit is tolerably abundant. Many districts are admirably adapted for grazing, and great numbers of excellent cattle are reared.

Arkansas was colonized as early as 1685 by the French. As part of Louisiana it was purchased by the United States in 1803. It was made into a separate territory in 1819, and admitted into the Union in 1836. It was one of the seceding States. The capital is Little Rock. The enumerated population in 1920 was 1,752,204.

**ARKANSAS.** A river of the United States, which gives its name to the above State, the largest affluent of the Mississippi after the Missouri. It rises in the Rocky Mountains, about lat. 39° N., long. 107° W., flows in a general south-easterly direction through Colorado, Kansas, the Indian Territory, and lastly through the State of Arkansas, and after a course of 2170 miles enters the Mississippi. During greater part of the year it is navigable for steamboats for 800 miles.

**ARK'LOW.** A town in Ireland, County Wicklow, on the right bank of the Avoca, which falls into the sea about 500 yards below the town; the scene of a severe fight during the rebellion of 1798. Fishing is the chief industry. It is famed for its beauty. Pop. 5042.

**ARK'WRIGHT,** Sir Richard. Famous for his inventions in cotton-spinning, was born at Preston, in Lancashire, in 1732, died 1792. The youngest of thirteen children, he was bred to the trade of a barber. When about thirty-five years of age he gave himself up exclusively to the subject of inventions for spinning cotton. The thread spun by Hargreaves' jenny could not be used except as weft, being destitute of the firmness or hardness required in the longitudinal threads or warp. But Arkwright supplied this deficiency by the invention of the *spinning-frame*, which spins a vast



Arkwright's Water Frame

number of threads of any degree of fineness and hardness, leaving the operator merely to feed the machine with cotton and to join the threads when they happen to break.

His invention introduced the system of spinning by rollers, the carding, or *roving* as it is technically termed (that is, the soft, loose strip of cotton), passing through one pair of rollers, and being received by a second pair, which is made to revolve with (as the case may be) three, four or five times the velocity of the first pair. By this contrivance the roving is drawn out into a thread of the desired degree of tenuity and hardness. His inventions being brought into a pretty advanced state, Arkwright removed to Nottingham in 1768 in order to avoid the attacks of the same lawless rabble that had driven Hargreaves out of Lancashire.

Here his operations were at first greatly fettered by a want of capital; but two gentlemen of means having entered into partnership with him, the necessary funds were obtained, and Arkwright erected his first mill, which was driven by horses, at Nottingham, and took out a patent for spinning by rollers in 1769. As the mode of working the machinery by horse-power was found too expensive, he built a second factory on a much larger scale at Cromford, in Derbyshire, in 1771, the machinery of which was turned by a water-wheel.

Having made several additional

discoveries and improvements in the processes of carding, roving, and spinning, he took out a fresh patent for the whole in 1775, and thus completed a series of the most ingenious and complicated machinery. Notwithstanding a series of law-suits in defence of his patent rights, and the destruction of his property by mobs, he amassed a large fortune. He was knighted by George III. in 1786.

**ARLBERG** (ärl'berh). A branch of the Rhætian Alps, in the west of Tyrol, between it and Vorarlberg, pierced by the fourth longest railway tunnel in the world. It is 6½ miles long, and was finished in Nov., 1883, and connects the valley of the Inn with that of the Rhine, and the Austrian railway system with the Swiss railways.

**AR'LECDON.** An urban district of England, in Cumberland, 4 miles east of Whitehaven, with coal and iron mines. Pop. (1921), 5152.

**ARLES** (ärl; ancient, **ARELÄTE**). A town of Southern France, department Bouches du Rhône, 17 miles south-east of Nismes. It was an important town at the time of Cæsar's invasion, and under the later emperors it became one of the most flourishing towns on the farther side of the Alps. It still possesses numerous ancient remains, of which the most conspicuous are those of a Roman amphitheatre, which accommodated 24,000 spectators. It has a considerable trade, manufactures of silk, etc., and furnishes a market for the surrounding country. Pop. 16,746.

**AR'LINGTON, Henry Bennet, Earl of.** Member of the Cabal ministry, and one of the scheming creatures of Charles II., born 1618, died 1685. He is supposed to have lived and died a Roman Catholic.

**ARLISS, George.** English actor. Born in London, April 16, 1868, he first appeared on the stage in London in 1887. In 1901 he went to the United States, where he made his reputation, and remained for the next 30 years. His successes include parts in *The Darling of the Gods* and *The Green Goddess*. Later he turned to the films and won great fame in the name-parts of Disraeli and Alexander Hamilton.

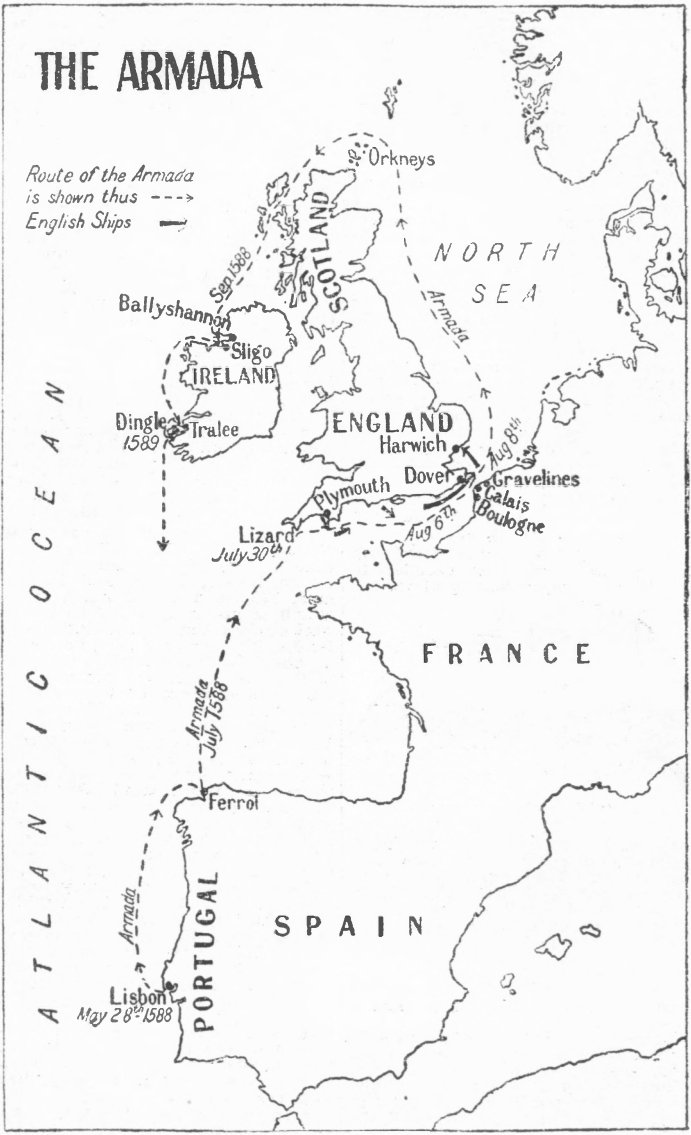
**AR'LON.** A Belgian town, capital province of Luxemburg, a thriving town, with manufactures of ironware, leather, tobacco, etc. Pop. 12,012.

**ARM.** The upper limb in man, connected with the thorax or chest by means of the scapula or shoulder-blade, and the clavicle or collar-bone. It consists of three bones, the arm-bone (*humĕrus*), and the two bones of the fore-arm (*radius* and *ulna*), and it is connected with the bones of the hand by the *carpus* or wrist. The head or upper end of the arm-bone fits into the hollow called the *glenoid cavity* of the scapula, so as to form a joint of the ball-and-socket kind, allowing great freedom of movement to the limb. The lower end of the humerus is broadened out by a projection on both the outer and inner sides (the outer and inner *condyles*), and has a pulley-like surface for articulating with the fore-arm to form the elbow-joint. This joint somewhat resembles a hinge, allowing of movement only in one direction.

The ulna is the inner of the two bones of the fore-arm. It is largest at the upper end, where it has two processes, the *coronoid* and the *olecranon*, with a deep groove between to receive the humerus. The radius—the outer of the two bones—is small at the upper and expanded at the lower end, where it forms part of the wrist-joint. The muscles of the upper arm are either *flexors* or *extensors*, the former serving to bend the arm, the latter to straighten it by means of the elbow-joint. The main flexor is the *biceps*, the large muscle which may be seen standing out in front of the arm when a weight is raised. The chief opposing muscle of the biceps is the *triceps*. The muscles of the fore-arm are, besides flexors and extensors, *pronators* and *supinators*, the former turning the hand palm downwards, the latter turning it upwards. The same fundamental plan of structure exists in the limbs of all vertebrate animals.

**ARMA'DA.** The Spanish name for any large naval force; usually applied to the Spanish fleet vaingloriously designated the *Invincible Armada*, intended to act against England, A.D. 1588. It was under the command of the Duke of Medina-Sidonia, and consisted of 130 great war vessels, larger and stronger than any belonging to the English fleet, with 30 smaller ships of war, and carried 19,295 marines, 8460 sailors, 2088 slaves, and 2630 cannon. It had scarcely quitted Lisbon on 29th May, 1588, when it was scattered by a storm, and had to be refitted in Corunna. It was to co-operate with a land force collected in Flanders under the Prince of Parma, and to unite with this it proceeded through the English Channel towards Calais.

In its progress it was attacked by the English fleet under Lord Howard, who, with his lieutenants, Drake, Hawkins, and Frobisher, endeavoured by dexterous seamanship and

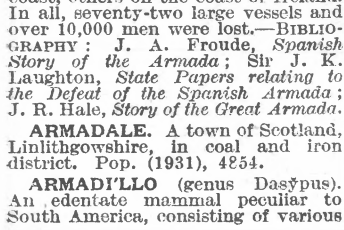

THE ARMADA
Route of the Armada is shown thus ---->
English Ships
Orkneys
SCOTLAND
NORTH SEA
Sept 1588
Armada
Ballyshannon
Sligo
IRELAND
Dingle
Tralee
1589
ENGLAND
Harwich
Aug 8th
Dover
Gravelines
Calais
Boulogne
Plymouth
Aug 6th
Lizard
July 30th
ATLANTIC OCEAN
FRANCE
Armada July 1588
Ferrol
Armada
PORTUGAL
SPAIN
Lisbon
May 28th 1588

the discharge of well-directed volleys of shot to destroy or capture the vessels of the enemy. The great lumbering Spanish vessels suffered severely from their smaller opponents, which most of their shot missed. Arrived at length off Dunkirk, the armada was becalmed, thrown into confusion by fire-ships, and many of the Spanish vessels destroyed or taken.

The Duke of Medina-Sidonia, owing to the severe losses, at last resolved to abandon the enterprise, and conceived the idea of reconveying his fleet to Spain by a voyage round the north of Great Britain; but storm after storm assailed his ships, scattering them in all directions, and sinking many. Some went down on the cliffs of Norway, others in the open sea, others on the Scottish coast, others on the coast of Ireland. In all, seventy-two large vessels and over 10,000 men were lost.—BIBLIOGRAPHY: J. A. Froude, *Spanish Story of the Armada*; Sir J. K. Laughton, *State Papers relating to the Defeat of the Spanish Armada*; J. R. Hale, *Story of the Great Armada*.

**ARMADALE.** A town of Scotland, Linlithgowshire, in coal and iron district. Pop. (1931), 4854.

**ARMADI'LLO** (genus Dasypus). An edentate mammal peculiar to South America, consisting of various



Armadillos—Left, Hairy Armadillo
Right, Kappler's Armadillo

species, belonging to a family intermediate between the sloths and ant-eaters. They are covered with a hard bony shell, divided into belts, composed of small separate plates like a coat of mail, flexible everywhere except on the forehead, shoulders, and haunches, where it is not movable. The belts are connected by a membrane which enables the animal to roll itself up like a hedgehog.

These animals burrow in the earth, where they lie during the daytime, seldom going abroad except at night. They are of different sizes: the largest, *Dasypus gigas*, being 3 feet in length without the tail, and the smallest only 10 inches. They subsist chiefly on fruits and roots, sometimes on insects and flesh. They are inoffensive, and their flesh is esteemed good food.—There is a genus of isopodous Crustacea called Armadillo, consisting of animals allied to the wood-lice, capable of rolling themselves into a ball.

**ARMAGEDDON** (-ged'don). The great battlefield of the Old Testament, where the chief conflicts took place between the Israelites and their enemies—the table-land of Esdraelon in Galilee and Samaria, in the centre of which stood the town of Megiddo, on the site of the modern Lejjun: used figuratively in the *Apocalypse* to signify the place of "the battle of the great day of God." It may, however, be *har migdo*, his fruitful mountain, "the mountan land of Israel." The phrase "an Armageddon" expresses any great slaughter or final conflict, and has been frequently applied to the Great War of 1914-18. During this war severe fighting took place in Sept., 1918, on the field of Armageddon, the entrance to the passes of Megiddo. The battle ended in an overwhelming victory for General Allenby's armies. *See* MEGIDDO.

**ARMAGH** (ar-mä'). A county of Northern Ireland, in Ulster; surrounded by Monaghan, Tyrone, Lough Neagh, Down, and Louth; area, 328,086 acres, of which about a half is under tillage. The north-west of the county is undulating and fertile. The northern part, bordering on Lough Neagh, consists principally of extensive bogs. On the southern border is a range of barren hills. The chief rivers are the Blackwater, which separates it from Tyrone; the Upper Bann, which discharges itself into Lough Neagh; and the Callan, which falls into the Blackwater. There are several small lakes. The manufacture of linen is carried on very extensively. Armagh, Lurgan, and Portadown are the chief towns. The county sends three members to Parliament. Pop. (1926), 110,083.

**County Town.** The county town, *Armagh*, is situated partly on a hill, about half a mile from the Callan. It has a Protestant cathedral crowning the hill, a Gothic building dating from the eighth century, repaired and beautified recently; a new Roman Catholic cathedral in the pointed Gothic style, and various public buildings. It is the see of an archbishop of the Protestant Episcopal Church, who is primate of all Ireland, and is a place of great antiquity. Pop. (1926), 7401.

**ARMAGNAC** (ar-mä-nyak). An ancient territory of France, in the

province of Gascony, some of the counts of which hold prominent places in the history of France. Bernard VII., son of John II., surnamed the Hunchback, succeeded his brother, John III., in 1391, and was called to Court by Isabella of Bavaria, with the view of heading the Orleans in opposition to the Burgundian faction, where he no sooner gained the ascendancy than he compelled the queen to appoint him Constable of France. He showed himself a merciless tyrant, and became so generally execrated that the Duke of Burgundy, to whom Isabella had turned for help, found little difficulty in gaining admission into Paris, and even seizing the person of Armagnac, who was cast into prison in 1418, when the exasperated populace burst in and killed him and his followers. John V., grandson of the above, who succeeded in 1450, made himself notorious for his crimes. He was assassinated in his castle of Lectoure in 1473 by an agent of Louis XI., against whom he was holding out.

**ARMAMENTS.** Term used for all the armed forces of a country, naval, military and air. Since the Great War there have been several attempts to limit, by mutual consent, the armaments of the countries of the world, and the attainment of this end is one of the objects of the League of Nations.

In 1922, at the Washington Conference, five Powers, the United States, Great Britain, France, Italy and Japan, agreed upon a scheme for a limitation on the size and number of their warships, and in 1930 the United States, Great Britain, and Japan agreed upon a further limitation. In 1932 a Conference on disarmament was held at Geneva.

**AR'MATURE.** A term applied to the piece of soft iron which is placed across the poles of permanent or electro-magnets for the purpose of receiving and concentrating the attractive force. In the case of permanent magnets it is also important for preserving their magnetism when not in use, and hence it is sometimes termed the *keeper*. It produces this effect in virtue of the well-known law of induction, by which the armature, when placed near or across the poles of the magnet, is itself converted into a temporary magnet with reversed poles, and these, reacting upon the permanent magnet, keep its particles in a state of constant magnetic tension, or, in other words, in that constrained position which is supposed to constitute magnetism. A horse-shoe magnet should therefore never be laid aside without its armature.

The armature of an electric generator is that part of the machine in which the currents are generated by induction. In an electric motor the armature is that part which receives the current and is acted upon inductively by the magnetic flux. Both in generators and in motors the armature is usually the rotating part.

**ARME BLANCHE.** A term applied to the rapier and duelling-foil, and frequently also to all weapons other than firearms. The phrase is particularly applied to the sabres and lances carried by cavalry, but also to the bayonet.

**ARME'NIA.** A mountainous country of Western Asia, of great historical interest as the original seat of one of the oldest civilised peoples in the world. The name Armenia occurs in the *Vulgate*, but the Hebrew name is Ararat. It has an area of about 120,000 sq. miles, and is intersected by the Euphrates, which divides it into the ancient divisions, Armenia Major and Armenia Minor. The country is an elevated plateau, enclosed on several sides by the ranges of Taurus and Anti-Taurus, and partly occupied by other mountains, the loftiest of which is Ararat.

**Rivers.** Several important rivers take their rise in Armenia, namely, the Kur or Cyrus, and its tributary the Aras or Araxes, flowing east to the Caspian Sea; the Halys or Kizil-Irmak, flowing north to the Black Sea; and the Tigris and Euphrates, which flow into the Persian Gulf. The chief lakes are Van and Urumiyah. The climate is rather severe. The soil is on the whole productive, though in many places it would be quite barren were it not for the great care taken to irrigate it.

**Produce.** Wheat, barley, tobacco, hemp, grapes, and cotton are raised; and in some of the valleys apricots, peaches, mulberries, and walnuts are grown.

**Inhabitants.** The inhabitants are chiefly of the genuine Armenian stock, a branch of the Aryan or Indo-European race; but besides them, in consequence of the repeated subjugation of the country, various other races have obtained a footing. The total number of Armenians is estimated at 2,900,000, of whom one-half are in Armenia. The remainder, like the Jews, are scattered over various countries, and are generally engaged in commercial

pursuits. They everywhere retain, however, their distinct nationality.

**History.** Little is known of the early history of Armenia, but it was a separate State as early as the eighth centry B.C., when it became subject to Assyria, as it also did subsequently to the Medes and the Persians. It was conquered by Alexander the Great in 325 B.C., but regained its independence about 190 B.C. Its king, Tigranes, son-in-law of the celebrated Mithridātes, was defeated by the Romans under Lucullus and Pompey between 69-66 B.C., but was left on the throne. Since then its fortunes have been various under the Romans, Parthians, Byzantine emperors, Persians, Saracens, and Turks.

Until quite recently Armenia had no political existence, having been partitioned between Turkey, Persia, and Russia, the last acquiring considerable portions in 1829 and 1878. The hope of the Armenians to see their country formed into an autonomous province administered by Christians was frustrated by the Treaty of Berlin in 1878. The advanced party amongst the Armenians, therefore, determined to obtain their object by the production of disturbances and the spread of a revolutionary movement. The Porte retaliated by wholesale massacres of the Armenians in 1896, 1904, and 1908.

The Armenian revolutionary and national parties in the meantime continued their activity and propaganda. Armenia proclaimed its independence in Aug., 1918. In Jan., 1920, the Supreme Council of the Allied Governments recognized the Armenian Republic of Erivan. A mandate for Armenia was also offered to the United States of America, but it was refused by the American Senate in May, 1920. On 18th March, 1922, Soviet Russia concluded a treaty with Turkey, giving to the latter most of Armenia. Batum was attached to Georgia. *See* ERIVAN, RUSSIA, TURKEY.

**Religion.** The Armenians received Christianity at an early date, most probably at the beginning of the third century, although native historians maintain that several of the apostles preached in Armenia. The real apostle of Armenia was Gregory the Illuminator, in the third century. During the Monophysitic disputes they held with those who rejected the twofold nature of Christ, and being dissatisfied with the decisions of the Council of Chalcedon (451) they separated from the Greek Church in 536. The Popes had at different times attempted to gain them over to the Roman Catholic faith, but have not been able to unite them permanently and generally with the Roman Church.

There are, however, small numbers here and there of United Armenians, who acknowledge the spiritual supremacy of the Pope, agree in their doctrines with the Catholics, but retain their peculiar ceremonies and discipline. But the far greater part are yet Monophysites, and have remained faithful to their old religion and worship. Their doctrine differs from the orthodox chiefly in their admitting only one nature in Christ, and believing the Holy Spirit to proceed from the Father alone. Their sacraments are seven in number. They adore saints and their images, but do not believe in purgatory. Their hierarchy differs little from that of the Greeks. The *Catholicus*, or head of the Church, has his seat at Etchmiadzin, a monastery near Erivan, the capital of former Russian Armenia, on Mount Ararat.

**Language.** The Armenian language belongs to the Indo-European family of languages, and is most closely connected with the Iranic group. The Old Armenian or Haikan language, which is still the literary and ecclesiastical language, is distinguished from the New Armenian, the ordinary spoken language, which contains a large intermixture of Persian and Turkish elements. The most flourishing period of Armenian literature extended from the fourth to the fourteenth century. It then declined, but a revival began in the seventeenth century, and at the present day wherever any extensive community of Armenians has settled they have set up a printing-press.

The Armenian Bible, translated from a Syriac version, and revised by means of the Septuagint, by Isaac the Great and St. Mesrop, early in the fifth century, is a model of the classic style.—BIBLIOGRAPHY: E. N. and H. Buxton, *Travel and Politics in Armenia*; N. T. Gregor, *History of Armenia*; W. L. Williams, *Armenia, Past and Present*.

**ARMENTIÈRES** (ār-mān-tyār). A town in France, department Nord, 10 miles W.N.W. of Lille, on the Lys. The town had extensive manufactures of linen and cotton goods and an extensive trade. The Germans captured Armentières by massed assault early in April, 1918, after methodically shelling the town for about two years and destroying almost every building in it. The enemy's offensive was intended to achieve greater results. Indeed, its object was to break through to the

Channel ports. It began on 9th April, after artillery preparation, from La Bassée to Armentières. When, however, the battle of Armentières died down, the enemy plan to break through to the coast had been definitely and finally frustrated. German losses were extremely heavy, their attacks having been made with massed troops. (*See* YPRES). Pop. 28,086.

**ARM'FELT, Gustav Moritz, Count** of. Swedish soldier, born 1757, died 1814. Though he had been highly favoured and loaded with honours by Gustavus III., he incurred the enmity of the Duke of Sudermania, guardian of the young king, Gustavus IV., and was deprived of all his titles and possessions. He was restored to his fortune and honours in 1799, when Gustavus IV. attained his majority, and held several high military posts. Ultimately, however, he entered the Russian service, was made count, chancellor of the University of Åbo, president of the department for the affairs of Finland, member of the Russian Senate, and served in the campaign against Napoleon in 1812.

**ARMIDA** (ar-mē'dà). A beautiful enchantress in Tasso's *Jerusalem Delivered*, who succeeds in bringing the hero Rinaldo, with whom she had fallen violently in love, to her enchanted gardens. Here he completely forgets the high task to which he had devoted himself, until messengers from the Christian host having arrived at the island, Rinaldo escapes with them by means of a powerful talisman. In the sequel Armida becomes a Christian.

**AR'MILLARY SPHERE** (Lat. *armilla*, a hoop). An astronomical instrument consisting of an arrangement of rings, all circles of one sphere, intended to represent the principal circles of the celestial globe, the rings standing for the meridian of the station, the ecliptic, the tropics, the arctic and antarctic circles, etc., in their relative positions. Its main use is to give a representation of the apparent motions of the celestial bodies.

**ARMIN'IANS.** A sect or party of Christians, so called from Jacobus *Arminius* or Harmensen. (*See* ARMINIUS.) They were called also *Remonstrants*, from their having presented a *remonstrance* to the States-general in 1610. The Arminian doctrines are: (1) Conditional election and reprobation, in opposition to absolute predestination. (2) Universal redemption, or that the atonement was made by Christ for all mankind, though none but believers can be partakers of the benefit. (3) That man, in order to exercise true faith, must be regenerated and renewed by the operation of the Holy Spirit, which is the gift of God; but that this grace is not irresistible and may be lost, so that men may relapse from a state of grace and die in their sins.

Arminianism being a revolt against certain aspects of Calvinism, especially the absolutism of the eternal decrees, its doctrines were vehemently attacked by the Calvinists of Holland, and were condemned by the Synod of Dort in 1619. The Arminians, in consequence, were treated with great severity; many of them fled to, and spread in, other countries, and though there is no longer any particular sect to which the name is exclusively applied, many bodies are classed as Arminians, as being opposed to the Calvinists on the question of predestination.—BIBLIOGRAPHY: Regenboog, *Historie der Remonstranten*; Caspar Brandt, *Life of Arminius* (English translation by J. Guthrie); W. B. Pope, *Compendium of Christian Theology* (3 vols.).

**ARMIN'IUS.** An ancient German hero, celebrated by his fellow-countrymen as their deliverer from the Roman yoke, born about 18-16 B.C., assassinated A.D. 19. Having been sent as a hostage to Rome, he served in the Roman army, and was raised to the rank of *eques*. Returning home, he found the Roman governor, Quintilius Varus, making efforts to Romanize the German tribes near the Rhine. Placing himself at the head of the discontented tribes he completely annihilated the army of Varus, consisting of three legions, in a three days' battle fought in the Teutoburg Forest. For some time he baffled the Roman general Germanicus, and after many years' resistance to the vast power of the Empire he drew upon himself the hatred of his countrymen by aiming at the regal authority, and was assassinated. A national monument to his memory was inaugurated on the Grotenburg, near Detmold, in 1875.—BIBLIOGRAPHY: *see* TACITUS, *Annals* (translated by Murphy); O. Kemmer, *Arminius*; F. W. Fischer, *Armin und die Römer*.

**ARMINIUS,** Jacobus (properly Jakob Harmensen). Founder of the sect of Arminians or Remonstrants, born in South Holland in 1560, died 1609. He studied at Utrecht, in the University of Leyden, and at Geneva, where his chief preceptor in theology was Theodore Beza (1582).

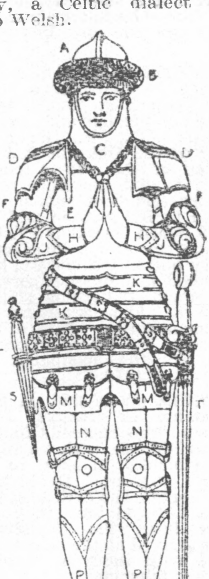
On his return to Holland he was appointed minister of one of the churches in Amsterdam, and chosen to undertake the refutation of a work which strongly controverted Beza's doctrine of predestination; but he happened to be convinced by the work which he had undertaken to refute. Elected in 1603 professor of divinity at Leyden, he openly declared his opinions, and was involved in harassing controversies, especially with his fellow professor Gomarus. These contests, with the continual attacks on his reputation, at length impaired his health and brought on a complicated disease, of which he died. *See* ARMINIANS.

**ARMISTICE.** Agreement between combatants to cease fighting. It may be either temporary for the purpose of removing the wounded, or burying the dead, or it may be a preliminary to a general peace, as in Nov. 1918. The armistice between Germany and her victorious foes in the west was signed on Nov. 11, 1918, and that day has since been observed as Armistice Day. Previously Bulgaria had concluded an armistice on Sept. 29, Turkey on Oct. 30 and Austria-Hungary on Nov. 3.

**AR'MITAGE, Edward.** English historical painter, born 1817, died 1896. He studied under Delaroche at the Ecole des Beaux Arts, Paris, was one of the ablest pupils of that painter, and in 1842 exhibited at the Salon (in the Louvre) a picture of *Prometheus Bound*. At the exhibition of cartoons for historical pictures in Westminster Hall (1843) he obtained a premium of £300 for his design of *Cæsar's First Invasion of Britain*. Other similar premiums were gained by his *Spirit of Religion* (1845), and *Battle of Mecanee* (1847—£500). He now went to study at Rome, and exhibited at the Academy in 1848 his *Henry VIII. and Katherine Parr*, and his *Trafalgar* (*Death of Nelson*).

He had pictures in most of the subsequent Academy exhibitions up nearly to the time of his death. In 1867 he was elected an associate, and in 1872 a full academician. He did much for the restoration of fresco painting in England. A large number of his pictures were biblical in subject, such as *Ahab and Jezebel*, *Esther's Banquet*, *The Remorse of Judas*, *Joseph and Mary*, *Herod's Birthday Feast*, etc. As professor of painting to the Royal Academy he delivered lectures on painting, which were published in 1883. In 1898 appeared a volume of his *Pictures and Drawings*.

**ARMOR'ICA** (from two Celtic words signifying "upon the sea"). A name anciently applied to all north-western Gaul, afterwards limited to what is now Brittany. Hence *Armoric* is one name for Breton or the language of the inhabitants of Brittany, a Celtic dialect closely allied to Welsh.




Armour, from the effigy of Sir Richard Peyton, in Tong Church, Shropshire.

A, Bascinet. B, Jewelled orle round the bascinet. C, Gorget, or gorgiere of plate. D, Pauldrons. E, Breastplate-cuirass. F, Rere-braces. G, Coudes or elbow-plates. H, Gauntlets. J, Vambrace. K, Skirt of taces. L, Military belt or cingulum richly jewelled. M, Tuilles or tuillets. N, Cuisses. O, Genouilleres or knee-pieces. P, Jambes. Q, Spurstraps. R, Sollerets. S, Misericorde or dagger. T, Sword suspended by a transverse belt.

**ARMOUR.** *See* ARMS.

**ARMOURED CAR.** A self-propelled car completely protected by bullet-proof armour-plating. Such a car is a stage in the development of mechanical warfare, i.e. warfare by means of a self-propelled, armed, and manned machine. The idea is a very ancient one, some form of protected vehicle having been in use among the Chinese in almost prehistoric times.

The modern armoured car is constructed on a strongly-engined chassis, and is provided with a bullet-proof armour-plating both for engine and crew. This armour is continued low down over the wheels. The armament of such a car consists of two heavy machine-guns, firing through slits in the armour-plating of the body of the car.

**ARMOUR-PLATES.** Iron or steel plates with which the sides of vessels of war are covered with the view of rendering them shot-proof. *See* NAVY.

**ARMS, COAT OF,** or **ARMORIAL BEARINGS.** A collective name for the devices borne on shields, on banners, etc., as marks of dignity and distinction, and, in the case of family and feudal arms, descending from father to son. They were first employed by the Crusaders, and became hereditary in families at the close of the twelfth century. They took their rise from the knights painting their banners or shields each with a figure or figures proper to himself, to enable him to be distinguished in battle when clad in armour. *See* HERALDRY.

**ARMS, COLLEGE OF.** *See* HERALD.

**ARMS and ARMOUR.** The former term is applied to weapons of offence, the latter to the various articles of defensive covering used in war and military exercies, especially before the introduction of gunpowder. Weapons of offence are divisible into two distinct sections—firearms, and arms used without gunpowder or other explosive substance. The first arms of offence would probably be wooden clubs, then would follow wooden weapons made more deadly by means of stone or bone, stone axes, slings, bows and arrows with heads of flint or bone, and afterwards various weapons of bronze. Subsequently a variety of arms of iron and steel was introduced which comprised the sword, javelin, pike, spear or lance, dagger, axe, mace, chariot scythe, etc.; with a rude artillery consisting of catapults, ballistæ, and battering-rams.

Greek Armour

**Greek Armour.** From the descriptions of Homer we know that almost all the Grecian armour, defensive and offensive, in his time was of bronze; though iron was sometimes used. The lance, spear, and javelin were the principal weapons of this age among the Greeks. The bow is not often mentioned.

**Egyptian Arms.** Among ancient nations the Egyptians seem to have been most accustomed to the use of the bow, which was the principal weapon of the Egyptian infantry. Peculiar to the Egyptians was a defensive weapon intended to catch and break the sword of the enemy. With the Assyrians the bow was a favourite weapon; but with them lances, spears, and javelins were in more common use than with the Egyptians. Most of the large engines of war—chariots with scythes projecting at each side from the axle, catapults, and ballistæ—seem to have been of Assyrian origin.

During the historical age of Greece the characteristic weapon was a heavy spear from 21 to 24 feet in length. The sword used by the Greeks was short, and was worn on the right side. The Roman sword was from 22 to 24 inches in length, straight, two-edged, and obtusely pointed, and as by the Greeks was worn on the right side. It was used principally as a stabbing weapon. It was originally of bronze.

The most characteristic weapon of the Roman legionary soldier, however, was the *pilum*, which was a kind of pike or javelin, some 6 feet or more in length. The pilum was sometimes used at close quarters, but more commonly it was thrown. The favourite weapons of the ancient Germanic races were the battle-axe, the lance or dart, and the sword. The weapons of the Anglo-Saxons were spears, axes, swords, knives, and maces or clubs.

The Normans had similar weapons, and were well furnished with archers and cavalry. The cross-bow was a comparatively late invention introduced by the Normans. Gunpowder was not used in Europe to discharge projectiles till the beginning of the

Roman Armour

fourteenth century. Cannon are first mentioned in England in 1338, and there seems to be no doubt that they were used by the English at the siege of Cambrai in 1339. The projectiles first used for cannon were of stone. Hand firearms date from the fifteenth century. At first they required two men to serve them, and it was necessary to rest the muzzle on a stand in aiming and firing.

The first improvement was the invention of the match-lock, about 1476; this was followed by the wheel-lock, and about the middle of the seventeenth century by the flint-lock, which was in universal use until it was superseded by the percussion-lock, the invention of a Scottish clergyman early in the nineteenth century. The needle-gun dates from 1838. The only important weapon not a firearm that has been invented since the introduction of gunpowder is the bayonet, which is believed to have been invented about 1650. *See* CANNON, MUSKET, RIFLE, etc.

**Defensive Coverings.** Some kind of defensive covering was probably of almost as early invention as weapons of offence. The principal pieces of defensive armour used by the ancients were shields, helmets, cuirasses, and greaves. In the earliest ages of Greece the shield is described as of immense size, but in the time of the Peloponnesian War (about 420 B.C.) it was much smaller. The Romans had two sorts of shields: the *scutum*, a large oblong rectangular highly-convex shield, carried by the legionaries; and the *parma*, a small round or oval flat shield, carried by the light-armed troops and the cavalry. In the declining days of Rome the shields became larger and more varied in form.

The helmet was a characteristic piece of armour among the Assyrians, Greeks, Etruscans, and Romans. Like all other body armour it was usually made of bronze. The helmet of the historical age of Greece was distinguished by its lofty crest. The Roman helmet in the time of the early emperors fitted close to the head, and had a neck-guard and hinged cheek-pieces fastened under the chin, and a small bar across the face for a visor. Both Greeks and Romans wore cuirasses, at one time

Soldier wearing Cuirass

of bronze, but afterwards of flexible materials.

Greaves for the legs were worn by both, but among the Romans usually on one leg. The ancient Germans had large shields of plaited osier covered with leather: afterwards their shields were small, bound with iron, and studded with bosses. The Anglo-Saxons had round or oval shields of wood, covered with leather and having a boss in the centre; and they had also corselets, or coats of mail, strengthened with iron rings.

An example of Chain Armour

The Normans were well protected by mail; their shields were somewhat triangular in shape, their helmets conical. In Europe generally metal armour was used from the tenth to the eighteenth century, and at first consisted of a tunic made of iron rings firmly sewn flat upon strong cloth or leather. The rings were afterwards interlinked one with another so as to form a garment of themselves, called *chain-mail*.

Horse-armour of Maximilian I. of Germany

*a*, Chamfron. *b*, Manefaire. *c*, Poitrinal, poitrel or breastplate. *d*, Croupiere or buttock-piece.

Another variety of this flexible armour was known as *banded-mail*. This consisted of rings sewn upon a fabric foundation, the whole being covered with leather. In addition to this, "scale armour," which had been in use from the very earliest periods of history, was still in common fashion in the thirteenth century. By degrees the suit of mail was reinforced by the addition of pieces of plate on the breast, knees, elbows, and arms, and by the end of the fourteenth century the full suit of plate had been evolved, the mail being only worn as a skirt round the waist or as a coif attached to the helmet.

The golden age of plate armour is the middle of the fifteenth century, when the design was light and graceful, and at the same time fully protective. In the sixteenth century, when "shock tactics" of cavalry were the order of the day, the "war harness" became heavier. This was particularly noticeable in the armour for the joust or tourna-

Allecret (Light Plate) Armour, A.D. 1540

ment, in which sport the aim of the contestants was to score points and not to inflict injury. Many of these jousting armours weigh over 80 lb. The weapons in use through the whole of the plate-armour period were the lance, the sword, the axe or war-hammer, the long-bow, and the cross-bow.

The introduction of firearms in the fourteenth century was one of the causes which led to the increase of weight in armour, for the armourer was continually improving and strengthening his products to make

them proof against musket and pistol, and he generally succeeded, but by doing so increased the weight till it became insupportable. In the seventeenth century leg armour was abandoned, and by the end of the civil war the popular defence was the steel cap and breast-plate. In the eighteenth century armour entirely disappeared, except for ceremonial, and was thought to be entirely obsolete till it was revived in the recent war in the form of the steel shrapnel-helmet, which was favoured by all the Allies and also by the enemy. The German troops occasionally used heavy body armour.

Daggers and clubs, weapons likewise thought to be obsolete, were frequently used by all combatants, especially on raids.—BIBLIOGRAPHY: A. Hutton, *The Sword of the Centuries*; H. S. Cowper, *The Art of Attack*; C. Ffoulkes, *Armour and Weapons*; C. H. Ashdown, *British and Foreign Arms and Armour*; C. Hall, *Modern Weapons of War by Land*.

**ARMSTRONG, John.** Scottish poet and physician, born about 1709, died 1779. After studying medicine in Edinburgh he settled in London. In 1744 he published his chief work, the *Art of Preserving Health*, a didactic poem. This work raised his reputation to a height which his subsequent efforts scarcely sustained. In 1746 he became physician to a hospital for soldiers, and in 1760 he was appointed physician to the forces which went to Germany. After his return to London he published a collection of his *Miscellanies*, which contained, however, nothing valuable. He afterwards visited France and Italy, and published an account of his tour under the name of Lancelot Temple. His last production was a volume of *Medical Essays*.

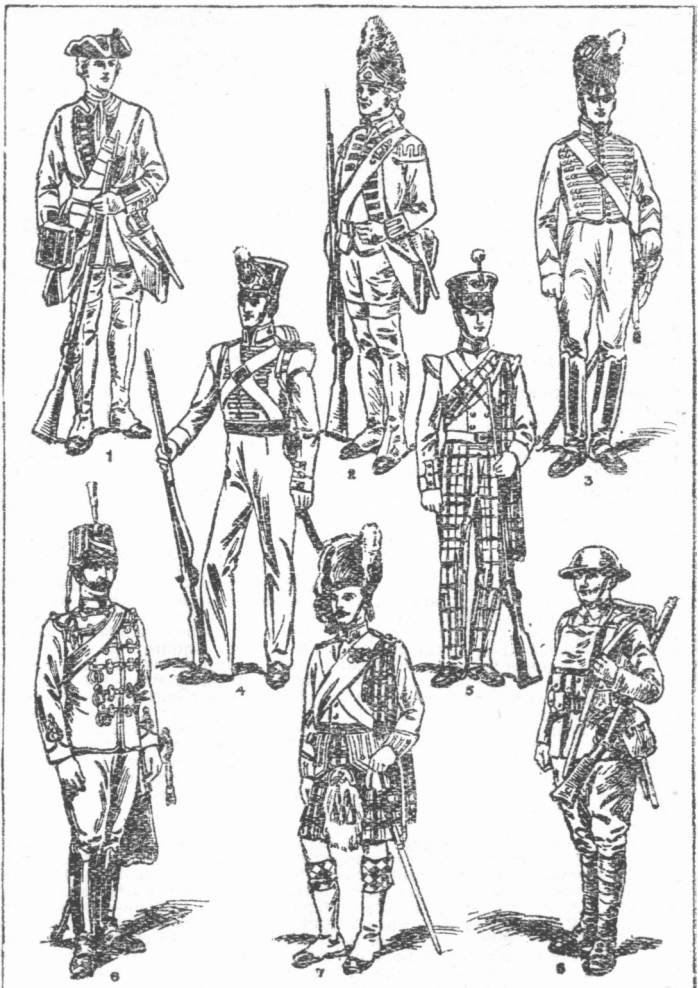
**ARMSTRONG, William George, Lord.** Engineer and mechanical inventor, born at Newcastle-on-Tyne, 10th Nov., 1810. He was trained as a solicitor, and practised as such for some time. Among his early inventions were the hydro-electric machine, a powerful apparatus for producing frictional electricity, and the hydraulic crane. In 1847 the Elswick works, near Newcastle, were established for the manufacture of his cranes and other heavy iron machinery, and these works are now among the most extensive of their kind. Here the first rifled ordnance gun which bears his name was made in 1854. His improvements in the manufacture of guns and shells led to his being appointed engineer of rifled ordnance under Government, and he was knighted in 1858. This appointment came to an end in 1863, since which time his ordnance has taken a prominent place in the armaments of different countries. He was made a peer, as Baron Armstrong, in 1887. He died 27th Dec., 1900.

**ARMSTRONG GUN.** A kind of cannon, so called from its inventor. It has an inner tube or core of steel, rifled with numerous shallow grooves, the tube being surrounded by a jacket of spirally-coiled bars of wrought iron, so disposed as to bring the metal into the most favourable position for the strain to which it is to be exposed. His first guns were small, but larger ones were soon made, and afterwards those of the very highest calibre. The breech-loading principle was also adopted in them, and special provision to effect this satisfactorily was invented by him. The improved shells introduced by him were of the elongated and pointed type now so well known, the charge being inserted in a special chamber behind the bore.

**ARMY.** A collection of bodies of men armed, disciplined, and organized for war. The essence of a modern army is that it shall be composed of organized units each under its own commander, grouped in formations of ever-increasing size, and owing allegiance through these commanders to one supreme head. Discipline and organization are essential, or such a force becomes merely a collection of armed men.

In the early days of our history every able-bodied man was, to a greater or lesser extent, a possible fighting man, and all had arms of one kind or another. Consequently, when an army was required, landowners and county authorities were ordered to provide the troops necessary. Every free landowner between the ages of sixteen and sixty was liable to service, which was limited to two months in a year. This was the Saxon "fyrd" system. Later it was improved on by the institution of "Thane's Service," which made it incumbent on the more considerable landowners to appear fully armed and mounted, and to serve for the whole campaign. The horse, however, was only used as a means of locomotion: for fighting purposes their riders dismounted, as did the dragoons of the seventeenth century and the mounted infantry of still more modern times.

The fyrd was an unorganised and undisciplined force and entirely ephemeral in its nature, so that we find the Danish kings of England



1. Coldstream Guards, 1742. 2. Royal Fusiliers, 1770. 3. Gunner, Royal Horse Artillery, 1815. 4, 90th Light Infantry, 1833. 5, Highland Light Infantry, 1849. 6, Hussars Trooper, 1877. 7, Black Watch Officer, 1902. 8, Active Service Dress, 1918.

casting about for some more permanent force, which came into existence under the title of the "House Carles," or Royal Guard. With the Norman Conquest the fyrd was largely supplanted by the feudal system of knight's service, according to which the country was divided into knight's fees, each of which had to provide its quotum of men. The gradual appearance of the custom of avoiding service by payments of money—in time regulated under the name of scutage—led to the employment of paid mercenaries, who for some two centuries were almost invariably foreigners.

In the twelfth century it was found that sufficient troops could not be provided under these two systems, so the fyrd was re-established as a National Militia by the Assize of Arms, and in the next century further steps were taken to protect it under the Statute of Winchester. In the fourteenth century the archer, with his long-bow, became a very important part of the fighting forces of England, and an army of those days consisted of the heavily-armed and armoured knights and men-at-arms for shock action, and the unarmoured archers for "volley action," to use a later term.

With the gradual disappearance of the foreign mercenaries, it became the custom for the king to issue indents to certain influential subjects for the raising of paid troops. From this custom arose the free companies, which, in time, became nothing more or less than commercial undertakings. The indents were accepted, and the men enlisted primarily for what could be got out of the business of fighting either in the shape of ransom or the sack of towns. Some attempt was also made at tactical organization, and an army of the period was divided into vanguard, battle, and rearguard.

Artillery also was beginning to be developed in Germany for siege purposes. The sixteenth century saw the first formation of companies into regiments, though as yet of no fixed strength. Arms were also modernized, and by the end of the century muskets, 18-feet pikes, and swords were the arms of infantry instead of the varied assortment of halberds, pikes, muskets, harquebuses, and long-bows common at the beginning. Elizabeth introduced the press-gang as an aid to recruiting, and abolished the white coat of the soldier in favour of a long red or blue cassock. In the next century Cromwell's new model army became the first standing army of England, and, though it was disbanded by Act of Parliament at the Restoration, one of its regiments —Monk's—remained, and is now the Coldstream Guards.

After this regiments were raised from time to time on one pretext or another, and the nucleus of a standing army became a *fait accompli*, though it was for a long time considered more as an appanage of the king than as a national institution. With the standing army came the first beginnings of civilian control, a Secretary-at-War being appointed in 1660. He had, however, no responsibility, and was subordinate to the commander-in-chief, and it was not till 1710 that he assumed his present responsibility to Parliament.

During the eighteenth century the strength of the army rose or fell according to the state of the military barometer and the success or otherwise of the various recruiting expedients, among which was the first attempt at a short-service system in 1703. In 1871-2 the old numbering in regiments was abolished and a territorial designation substituted. According to this scheme, the first twenty-five regiments, all of which had already two battalions, were grouped together, the rest being joined arbitrarily to form new regiments under county designations. With these regiments were affiliated the militia and volunteer battalions, which have now been amalgamated into the Special Reserve and the Territorial Force.

For the requirements of the war of 1914-8 the Empire, as a whole, including India, raised and maintained a total of 8,654,467 men, of which the contribution of the United Kingdom was over 6,000,000. Casualties for the whole Empire were 3,060,616, of which the United Kingdom has for her share nearly 2,500,000, including 666,083 killed, 1,644,786 wounded, and 140,312 missing.

During 1918 the combatant strength of all arms of the British army in France fluctuated between 1,293,000 in March and 1,164,790 in November, while the rifle or infantry strength was from 616,000 to 416,748 during the same periods. From the date of the armistice to 31st Dec., 1919, the following number of demobilizations and discharges were effected :—

Demobilized.—Officers, 144,144; other ranks, 3,332,882.

Discharged as medically unfit.—Officers, 23,476; other ranks, 207,500.

Discharged from reserves.—Other ranks, 143,603.

**Modern Army.** The modern British army is governed by the Army Council (instituted 1904), presided

over by the Secretary of State for War. This Council, which consists of four military and four civilian members, including the president, works through the War Office, of which the principal departments are in charge of one or other of the members of the Council. On the military side these departments are those of the Chief of the Imperial General Staff, the Adjutant-General to the Forces, the Quartermaster-General to the Forces, and the Master-General of the Ordnance. For administrative and training purposes the United Kingdom is divided into six Commands and two Districts (London and Northern Ireland). When necessary, Commands are further subdivided into Districts.

The army, generally speaking, consists of (1) the Regular Army, (2) the Territorial Force, and (3) the Reserves. The service battalions, which formed such a large and important part of the army in the war, do not, properly speaking, form part of the permanent military forces, though the organization of the army as a whole is such that it is capable of expansion to any extent by the process of raising new battalions and affiliating them to existing regular or territorial units.

The regular army comprises the Household Cavalry, Cavalry of the Line, the Royal Regiment of Artillery, the Corps of Royal Engineers, the Brigade of Guards, and Infantry of the Line, and the Royal Tank Corps. In addition there are administrative troops and services such as the Royal Army Service Corps, the Royal Army Medical Corps, with its allied service Queen Alexandra's Imperial Military Nursing Service, the Royal Army Ordnance Corps, and others.

The Machine-gun Corps, which, like the Tank Corps, came into existence during the World War, has no permanent status, but machine-gun companies form an integral portion of each battalion of the regular army.

Under the conditions of the war the old national method of voluntary recruitment was found to be insufficient, and recourse was had to the principle of universal military service. Under the Military Service Acts the age limit was gradually raised till it finally included all men up to the age of fifty. Exceptions were made in the case of munition-workers, or those employed on work of national importance. Since the signature of the Treaty of Peace the army so raised was gradually demobilized till, by 31st March, 1920, it had decreased to 400,000, including 100,000 Indians paid by the Imperial Government. Concurrently with demobilization, voluntary enlistment was reintroduced, and the post-war army is once more a voluntary one, in which men serve under very much improved conditions as to pay and prospects.

The period of service under this system is twelve years, of which seven normally are with the colours and five in the reserve: in certain cases modifications of these periods are allowed, and, in addition, a soldier may be allowed to extend his colour service to the full twelve years, or, in exceptional cases, to complete twenty-one years for pension. Discharge or transfer to the reserve is ordinarily granted on completion of the agreed period of service.

**Pay.** Pay of all ranks was very materially improved in 1919. Whereas formerly a private soldier on enlistment received 1*s.* a day, he now receives 2*s.* 9*d.*, and after two years service 3*s.* 6*d.* To this last amount is added, under very reasonable conditions, a further daily sum of 6*d.* proficiency pay. A sergeant now gets 7*s.* a day instead of from 2*s.* 4*d.* to 3*s.* 4*d.*, and a regimental sergeant-major 14*s.* instead of 5*s.* or 6*s.* Add to these rates of pay free rations, free housing, free medical attendance, and, in the future, doubtless free education, and it must be admitted that the present-day soldier is not badly paid. The rate of pay is a flat rate for all arms, special allowances being given where necessary.

**Cavalry.** The Household Cavalry comprises the 1st and 2nd Life Guards and the Horse Guards (Blues). In peace-time they serve only in London and Windsor. They alone retain the old cavalry rank of corporal of horse instead of sergeant. Cavalry of the line consists of dragoon guards, dragoons, hussars, and lancers. The dragoon guards are numbered separately from 1 to 7, while dragoons, hussars, and lancers run consecutively from 1 to 21. A regiment of cavalry is commanded by a lieutenant-colonel and consists of 25 officers and 497 other ranks. Each regiment is organized in three squadrons commanded by majors, while a squadron is divided into four troops, each under a subaltern officer, troops being further subdivided into sections under non-commissioned officers.

Cavalry regiments, except hussars, carry guidons or standards for ceremonial purposes. These differ from the colours of infantry in that they are not consecrated and are carried by non-commissioned officers instead of by officers. Hussars carry no

standards. There are six cavalry depots for recruiting and preliminary-training purposes, i.e. for lancers at Woolwich, hussars at Scarborough, Bristol, and Dublin, and dragoons at Newport (Mon.) and Dunbar. The Cavalry Special Reserve consists of the Irish Horse and King Edward's Horse, and during the war reserve cavalry regiments were maintained.

**Artillery.** The Royal Regiment of Artillery comprises batteries of horse artillery designated by letters of the alphabet, and batteries of field, siege, heavy, and mountain by numbers. A battery, with some exceptions in the case of the heaviest type, consists of six guns or howitzers, horse artillery having 13-pounder guns, and field artillery 18-pounder guns or 4.5-inch howitzers. Horse artillery is intended to act with cavalry, and is therefore provided with a rather lighter gun. It can go anywhere that cavalry can go, and all the gun detachments are mounted. Field artillery works with infantry, and the gun detachments either walk or are carried on the limbers, only the officers, certain non-commissioned officers, and specialists such as scouts, range-finders, and trumpeters being mounted.

A battery is commanded by a major, with a captain as second-in-command, and is organized in three sections of two guns each under a subaltern. These sections are again subdivided into subsections of one gun each under a sergeant. Each gun is drawn by six horses, the driver of the leading pair being responsible for direction and pace. A corporal in the Royal Artillery is known as a bombardier, and the rank and file as gunners or drivers, according to their special duties, though drivers are also trained to some extent as gunners.

Heavy and siege artillery have come into their own in the late war, and consist roughly of all armament heavier than that of field artillery. Sixty-pounders and 4.7-inch howitzers form heavy batteries, while guns of 6 inch and upwards drawn by mechanical transport or mounted on railway trucks are known as siege batteries. Mountain artillery, of which most of the batteries are in India, is armed with 2.95-inch screw guns capable of being dismantled and carried piecemeal on mules. Another form is found on the west coast of Africa, where carriers take the place of mules. These guns are brought into action very quickly, but their shell-power is small.

The corps of Royal Engineers is responsible for the construction and maintenance of barracks, fortifications, and other military works, and for the personnel required for searchlights and electrical communications of the coast and anti-aircraft defences. With few exceptions the personnel of the corps is recruited entirely from skilled tradesmen and artisans. For service in the field, Royal Engineer units known as field squadrons and field companies accompany the fighting troops, and carry a certain amount of bridging material and tools. More highly specialized units carry out such services as mining, heavy bridging, railway, survey, and sound-ranging work. An important feature of Royal Engineer work in war is the supply of materials and stores, for which purpose an elaborate organization is provided in addition to the units already noted.

The Brigade of Guards—the infantry of the household troops—comprises the five regiments of foot-guards. These are the Grenadier, the Coldstream, the Scots, the Irish, and the Welsh Guards of from one to three battalions each. Being household troops these regiments are subject to certain special regulations and have certain privileges. As a general rule they serve only in London, Windsor, or Aldershot, and only leave England for active service, though individual battalions have served in the past both in Cairo and Gibraltar.

**Infantry.** The infantry, of which there are sixty-four regiments of from two to four battalions each, provides the bulk of the army. Infantry is formed into regiments for recruiting and territorial distribution purposes, but the battalion is the actual unit both for fighting and administration. In many cases the Army List gives the name of an officer holding the appointment of colonel of the regiment: this is in all cases a purely honorary appointment and entails no duties or responsibilities. An infantry battalion is commanded by a lieutenant-colonel and consists of 32 officers and 1000 other ranks. Both in peace and war a battalion is divided into headquarters and four companies, each of the latter having six officers, including the company commander, who is a major or senior captain. Subalterns command platoons.

**Recruits.** For recruiting purposes for infantry of the line the country is divided into Regimental Districts, in which are located the depots of the regiment concerned: these depots are commanded by a senior officer of one of the battalions of the regiment with the necessary staff for training purposes. Recruits are usually first trained at the depot and later trans-

ferred to the battalion requiring them. The Regimental Districts are again combined into larger districts in which are situated the Record Offices dealing with the regiments of the district.

The denomination of the district dealing with any particular regiment is shown in the Army List in brackets. The principles of interior organization are the same throughout the army, and as they can be best illustrated with the example of an infantry battalion a short description of this organization follows. Owing to the continual growth of military science, the improvement in arms and means of destruction generally, and the confusion and noise inseparable from a modern battle, the size of the personally-controlled unit has gradually decreased till, in the present day, in the British army, it is accepted as an axiom that no larger number of men than six can be conveniently controlled in battle by one man.

In former days companies, battalions, and even larger formations were both controlled and received their executive orders direct from their commanders—and to such an extent was this carried that Fortescue, in his *History of the British Army*, notes that Marlborough was in the habit of putting his whole army through the platoon exercise by means of flags and bugle-calls. This, of course, was not actually in face of the enemy, but the principle is the same. The stress of modern war now makes individual control of large bodies impossible, and the British army is therefore organized both for peace and war in a series of units of ever-increasing size, each under its own commander, who is responsible to his immediate superior for the well-being, training, and leading of his command. Taking the infantry organization as an example, we find that in the lowest stage, that of the "section," the command is both personal and direct, in that the corporal controls and commands the six men composing his fighting unit personally and directly by word of mouth.

In peace-time, and for administrative and training puposes, the section may reach to ten men, who live, work, and play together. In the next stage—that of the "platoon," consisting of four sections—we find the control is rather less personal and direct, in that the platoon commander, a subaltern, controls his command largely through his subordinates, the section commanders. A further stage is that of the "company," which consists of four platoons and company headquarters. A company is commanded by a major or senior captain, has a captain as second-in-command, and a company sergeant-major and quartermaster-sergeant to assist in running it. Here again the control is less direct though still personal. The next stage is the amalgamation of companies into a battalion, consisting of a headquarters and four companies.

Battalion headquarters consist of a lieutenant-colonel commanding, a major second-in-command, an adjutant, and a quartermaster. Certain other officers, when required, and the regimental sergeant-major and quartermaster-sergeant, and various other ranks make up the total of some 130. The commanding officer of a battalion is directly responsible for the well-being of his command, for its training, discipline, equipment, and general efficiency. In carrying on his duties he works through his company commanders, and with the assistance of the regimental staff mentioned above, so that we have a direct chain of command and responsibility from the corporal commanding a section of six to ten men through platoons and companies to the lieutenant-colonel commanding a battalion of some thousand men.

A detail of armament made possible by the enormous increase of machine-guns necessitated during the war is interesting. Thirty-two Lewis-guns are now provided for each infantry battalion, and are distributed to alternate sections in a platoon. Thus in each platoon two sections are known as rifle sections and two as Lewis-gun sections, and these arms are normally used by the respective sections; but men of all sections are trained in the use of both rifle and Lewis-gun.

When we come to formations larger than a battalion, we find the system of control and command becoming less and less personal and direct, as in all such formations the commander works to a less or greater extent through his staff. Roughly speaking, the staff is of two divisions, the one consisting of the general staff branch and the other of the branch of the adjutant and quartermaster-general. Again speaking very generally, the general staff is charged with duties bearing directly on military operations, while officers of the adjutant and quartermaster-general's branch deal more with administrative questions. Officers of the general staff are known as general staff officers, while those of the other branch are called, for example, assistant or deputy-assistant

adjutant or quartermaster-general, according to their several duties.

The formation in which distinct and separate units are first collected under one superior commander is known as a brigade. This, according to present establishment, consists of three battalions and a trench-mortar battery, the whole under a general officer called a brigadier-general, assisted by a staff of two officers—a brigade-major and a staff-captain. Since March, 1920, however, the title of brigadier-general has been altered to "colonel-commandant." The strength of a brigade is something over 3000 of all ranks.

**Division.** In a division, which is the next highest formation, and which is commanded by a major-general with a staff of three general staff officers and three officers belonging to the A.G. and Q.M.G. branch, we find the first appearance of a mixed force. It is not a force of "all arms," as cavalry is not included, but, in addition to infantry (three brigades), it has a considerable strength in artillery, besides engineers and the necessary administrative troops. Two or more divisions, together with a cavalry regiment and certain other troops, form an "army corps," and two or more corps go to make up an "army." These are not at present peace-time formations of the British army.

Of the administrative troops and services already mentioned, the Royal Army Service Corps provides for the material wants of the army both in the way of food and transport. It is organized in companies designated by numerals.

**The Royal Army Medical Corps** provides the personnel and organization for the medical and sanitary services of the army. In peace-time this service is organized on a garrison basis, hospitals being established where required for the use of all troops in that particular garrison. For war purposes medical officers are still attached to regiments, and in addition the corps provides the personnel and organization necessary for field ambulances, casualty clearing-stations, hospital trains and ships, and various classes of fixed hospitals. The corps is organized in numbered companies, and the rank and file are trained in first aid and amublance duties generally. It is administered by a director-general of Army Medical Services with the rank of lieutenant-general, who is an officer of the adjutant-general's department.

The other departments and administrative services of the army consist of the Royal Army Ordnance Corps, dealing generally with munitions of war; the Army Pay Department; the Royal Army Chaplains' Department; and the Royal Army Veterinary Corps, of which the functions are sufficiently designated by their title. In addition, there are manufacturing establishments at Woolwich Arsenal and elsewhere.

**The Army Reserve** consists of men who have completed their term of colour service, or service with a unit, and have thus passed into civil life, though still remaining liable for a period of years to be recalled to the colours if mobilization is ordered.

**The Special Reserve** was formed under the Territorial and Reserve Forces Act of 1907 out of the old militia. It consists generally of one battalion to each regiment of infantry, and is numbered consecutively with regular battalions of the regiment. It will, in the future, probably be again known as the Militia.

**The Royal Marines**—artillery and infantry, or the "blue" and the "red" marines, Kipling's "soldier and sailor too"—are not part of the army proper, as they are administered by the Admiralty. They are, however, amenable to the Army Act when serving ashore. The term of service is for twelve years, which may be extended to twenty-one. In 1923 the R.M.A. and the R.M.L.I. were amalgamated into one corps, known as the Royal Marines.

**The Territorial Force,** or, as it is to be called in future, the Territorial Army, is raised entirely on a county or territorial basis. It was originally created by the Territorial and Reserve Forces Act of 1907 out of a nucleus of the old yeomanry and volunteers. It is raised and administered by County Associations in each county and principal city. These associations consist of a president, chairman, military representative, and co-opted members. The administration of the Territorial Army is carried out by the County Associations in accordance with schemes provided by the Army Council, while all questions of training are reserved to the War Office.

The Territorial Army consists of all arms, including machine-gun corps and the necessary administrative services: its full war establishment is fixed at approximately 345,000 of all ranks, though, for the present, only some 60 per cent of them are to be enlisted. The rejuvenated Territorial Army is to be in all respects a true second line of imperial defence, self-contained and self-supporting, while the regular army and its special reserve of militia battalions form the first line.

Defence entails a certain amount of offence to bring it to a successful issue: it has therefore been decided that the new Territorial Army will not be relegated merely to the duty of guarding the country from invasion, but will, in a national emergency, be entitled to take its place under its own organization in the fighting line in any part of the world where its services may be required. This will entail enlistment for general service, but the interest of the force and of individuals composing it are safeguarded by the proviso that before the Territorial Army can be ordered out of the country an Act authorizing the movement be passed by Parliament.

It is further provided that the Territorial Army will on no account be called on to supply drafts for regular regiments, and that in case fresh regiments have to be raised on the lines of the New Army, the machinery of the Territorial Army will be used to organize them. Enlistment will be for three or four years, according to whether a man has served during the European War (1914-8) or not; age limits are normally between 18 and 38.

The army is to be organized in one cavalry (yeomanry) division of 12 regiments, and 14 infantry divisions each under a selected general officer, either regular or territorial. Pay and allowances during training periods will be as in the regular army, and in addition certain bounties will be obtainable. Training periods will be fifteen days in camp annually, besides a minimum number of drills and a musketry course. On completion of colour service a man will pass to the Territorial Reserve.

**The New Army,** consisting of the "service battalions" of existing regiments, is a product of the war. When, on the outbreak of war, many new regiments were rapidly raised, they were affiliated to regular regiments with consecutive numbers after the territorial battalions, and this organization was continued and extended to cope with the personnel obtained under the Military Service Acts.

**Educational Establishments.** Educational establishments connected with the army include the Staff College, the Royal Military College at Sandhurst, and the Royal Military Academy at Woolwich. At the Staff College officers obtain a course of instruction and study to fit them for service on the staff of the army. At Sandhurst, where the course of instruction is two years, some 700 gentlemen cadets are trained for commissions in the guards, cavalry, and infantry of the line, and the Indian army. At Woolwich gentlemen cadets desirous of entering the Royal Artillery or the Royal Engineers receive their training. In addition to these there are schools of gunnery and engineering, the Small Arms School at Hythe, the School of Physical Training at Aldershot, and many others: while, for sons and orphans of soldiers, there are the Duke of York's Royal Military School and the Queen Victoria School.

The Royal Hospital, Chelsea, and the Royal Hospital, Kilmainham, Dublin, are institutions for the care of old and distressed soldiers. In every garrison there are garrison schools for soldiers under fully qualified army schoolmasters, while in the future there is likely to be a very great increase in educational facilities of all kinds for the rank and file of the army. The training of the British army for war now embraces a variety of subjects, and at the Royal Military College and Academy the gentlemen cadets are not only taught the principles and practice of their future profession, but are also instructed in the methods of imparting their knowledge to others. For example, the course of training at the Royal Military College embraces drill and weapon training—under which head is included musketry (both theory and practice) and bayonet work—physical training, and riding.

As part of the physical-training course they receive instruction as to the best methods of organizing regimental assaults-at-arms and sports. Among the more academic subjects are military history and tactics, field sketching and topography, field engineering, military law and administration, and elementary hygiene. A great deal of practical work is done, and the course of two years is designed to fit a young officer, on joining his regiment, to undertake the entire charge and training of his troop or platoon. At the Royal Military Academy extra subjects, such as artillery work and more advanced engineering, are also taught.

**Training.** As to the soldier's training generally, drill is insisted on as an aid to discipline, which it undoubtedly is, and exact performance of the various movements ordered is expected. In other branches of training more individuality is allowed, and the days when the bayonet exercises was performed by a battalion to the music of the regimental band having passed, considerable latitude as to positions and execution is

permitted in this particular branch, attention being principally concentrated on inculcating the "offensive spirit." The modern soldier also learns how to use a Lewis-gun to throw or fire a grenade, what to do in case of a gas attack, the rudiments of field engineering, and how to keep himself healthy.

In addition to the more generally-known units of the army there are certain corps which, though raised in the colonies, still form part of the army, and which are administered by the imperial authorites. Under this head are the Royal Malta Artillery (local service). The West India Regiment was disbanded in 1927, and the West African Regiment was disbanded in 1928. Among other colonial corps maintained by the imperial Government, though not forming part of the regular army, are the West African Frontier Force (Nigeria) and the King's African Rifles (East Africa). Both these are administered by the Colonial Office.

*Dominions.*—The military forces of the self-governing dominions are raised and organized under the laws of such dominions.

Those of the Commonwealth of Australia were, till 1929, organized on a system of compulsory military training for all males between the ages of twelve and twenty-six, but training is now voluntary. In the earlier stages boys are trained in cadet corps, from which they pass to the Citizen Army, and from there, having attained the age of twenty-six, to recognized rifle clubs. The annual period of training in the Citizen Army is sixteen days.

The militia force consists of fifteen 4-battalion brigades of infantry, eighteen regiments of light horse, twenty-three 4-gun batteries, and the necessary complement of engineers and administrative troops. During the war this organization was in abeyance, and regiments were raised as required for overseas service, and, though proposals for conscription were negatived, the commonwealth still managed to send some 330,000 men to the various theatres of war out of 417,000 raised. The casualties, killed, wounded, and missing, amounted to 210,724.

The Commonwealth also maintains a small permanent force of trained professional soldiers.

The New Zealand forces are organized on the principle of universal training for all males. The details differ somewhat from those formerly in favour in Australia, but the principle is the same, i.e. that every male should be trained for home defence. Boys of from twelve to eighteen years of age are trained in cadet corps, from which they pass to regiments of the Territorial Force, and from twenty-five to thirty belong to the reserve. Cadets do annually a specified number of drills, while the territorial training extends to seven clear days, a musketry course, and certain drills every year. For the purposes of the war, conscription was introduced in 1916, and 220,000 men were raised between 1914 and 1918, out of which the casualties were nearly 57,000.

Canada, unlike Australia and New Zealand, has no system of graduated military training. The military forces of the dominion are organized as a militia under a Minister of Militia and Defence working with a Council. This militia is recruited by voluntary enlistment, and, on the outbreak of war, consisted of a permanent force of 3000 and some 60,000 men who had received militia training. This made possible the rapid dispatch to France of a division which, by 1916, had increased to a corps of four divisions and a cavalry brigade. Like the Mother Country and New Zealand, Canada introduced conscription in 1917, and during the war raised nearly 641,000 men and suffered 206,149 casualties, of which 56,110 were killed, 149,733 wounded, and 306 missing.

The Union of South Africa divides its military forces into the permanent force and the citizen force. There is also a coast-defence force. The permanent force consists of the five regiments of the South African Mounted Rifles. South Africa's greatest military effort during the war was directed towards German South-West and East Africa, but some 27,000 men were enlisted for and sent to Europe out of a total number of 136,000 raised. This total does not include coloured troops. The casualties were 18,000.

In other self-governing portions of the Empire troops were raised as required, and in the West and East African colonies the existing formations of native troops were considerably increased for service in suitable portions of the various theatres of war. The official statement of troops raised shows under the heading of "other colonies" 134,837, including coloured troops from South Africa and the West Indies. The casualties among them amounted to 7519.

*The Army in India.*—The military forces in India consist of those units of British cavalry, artillery, and infantry temporarily serving in the country, and the Indian army proper,

consisting of regiments recruited from among the native inhabitants and normally serving there. Enlistment is voluntary and for general service, one of the promises made by a man on enrolment being "to go wherever ordered by land and sea and not to allow caste usages to interfere with his duties as a soldier." The Indian army, as a disciplined and organized force, dates from the years between 1748 and 1758. In 1748 Major Stringer Lawrence arrived in Madras with a commission from the Company as commander-in-chief.

His first act was to form the existing European independent companies into regiments; his second to raise certain native independent companies. In 1758 he formed these companies in their turn into battalions, which he designated "coast sepoys," and which still exist under their present names of the 61st Pioneers and following numbers. His system was extended to the other presidencies, and at the period of the mutiny, in 1857, the native army in India consisted of some 230,000 regular troops, besides irregulars. When the post-mutiny reconstruction took place, the army was reorganized on an irregular basis instead of as regular regiments on the British model. According to this new system, the number of British officers in a regiment was considerably reduced; native officers were given command of troops and companies, while the British officer's command became the squadron, or wing.

Native artillery, with the exception of certain mountain batteries, was abolished, and cavalry was reconstituted on the Silladar system, whereby, in consideration of a larger monthly pay than was given to the infantry sepoy, the trooper, or sowar, provided his own horse and sword. The system thus introduced virtually remains to the present day, though it has been modified and improved to suit later conditions. The infantry officer's command has decreased from the wing of four companies to the double company of two, and it is now known as a company and is organized in four platoons on the British service model, platoons being commanded by Indian officers.

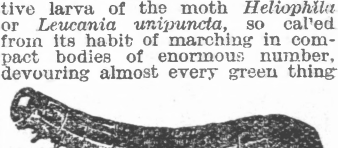
Of late years the number of British officers with an Indian regiment has been increased to twelve, and at the present time a committee is sitting in India to deliberate on the future construction of the army. It is therefore impossible to give details of its future strength. This, just before the war, was some 160,000, organized in 38 regiments of cavalry, the corps of guides, 3 regiments of sappers and miners, 118 regiments of infantry of 1 battalion each, and 10 regiments of Gurkhas of 2 battalions each. There were also 13 mountain batteries. The "Imperial Service Troops," of which many contingents took part in the war, are raised, paid, and maintained by princes and chiefs as a contribution to the defence of the country, while their training is supervised by British inspecting officers. The "Indian Defence Force," which has lately replaced the volunteers, and in which service is compulsory for Europeans, is available for home defence only.

During the war India, by voluntary enlistment, provided 1,401,350 men. Of these many new regiments were formed, and second, third, and fourth battalions added to existing regiments. Casualties were very nearly 114,000, including some 48,000 killed. Native Indian officers of cavalry are known as ressaldars, ressaiders, and jemadars, while those of the infantry are called subadars and jemadars. In each regiment the senior Indian officer is called ressaldar or subadar-major.

The army in India, by which is meant all military forces in India, is administered by a commander-in-chief, who is a member of council. The headquarter staff includes a military secretary, the chief of the general staff, an adjutant and a quartermaster-general, director-general of ordnance and military works, and a director of medical services.—BIBLIOGRAPHY: Hon. J. W. Fortescue, *History of the British Army*; C. W. C. Oman, *A History of the Art of War: Middle Ages*; C. H. Firth, *Cromwell's Army*; C. Walton, *History of the British Standing Army*, 1660-1700; War Office, *Army Book for the British Empire*; F. N. Maude, *Evolution of Modern Strategy*; G. F. R. Henderson, *The Science of War*; C. Romagny, *Histoire générale de l'armée nationale*; Heimann, *L'Armée allemande*.

**ARMY ACT.** *See* MILITARY LAW.

**ARMY WORM.** The very destructive larva of the moth *Heliophila* or *Leucania unipuncta*, so called from its habit of marching in compact bodies of enormous number, devouring almost every green thing



The Army Worm—a destructive insect

it meets. It is about 1½ inches long, greenish in colour, with black stripes, and is found in various parts of the world, but is particularly destructive in North America. The larva of *Sciara militaris*, a European two-winged fly, is also called army worm.

**ARNAT'TO, or ANNOTTA.** *See* ANNATTO.

**ARNAULD** (ar-nō). The name of a French family, several members of which greatly distinguished themselves.—Antoine, an eminent French advocate, was born 1560, died 1619. Distinguished as a zealous defender of the cause of Henry IV., and for his powerful and successful defence of the University of Paris against the Jesuits in 1594. His family formed the nucleus of the sect of the Jansenists (*see* JANSENIUS) in France.—His son Antoine, called the *Great Arnauld*, was born 6th Feb., 1612, at Paris, died 9th Aug., 1694, at Brussels. He devoted himself to theology, and was received in 1641 among the doctors of the Sorbonne. He engaged in all the quarrels of the French Jansenists with the Jesuits, the clery, and the Government, was the chief Jansenist writer, and was considered their head.

Excluded from the Sorbonne, he retired to Port Royal, where he wrote, in conjunction with his friend Nicole, a celebrated system of logic (hence called the *Port Royal Logic*). On account of persecution he fled, in 1679, to the Netherlands. His works, which are mainly controversies with the Jesuits or the Calvinists, are very voluminous.—His brother Robert, born 1588, died 1674, retired to Port Royal, where he wrote a translation of Josephus, and other works.—Robert's daughter Angélique, born 1624, died 1684, was eminent in the religious world, and was subjected to persecution on account of her unflinching adherence to Jansenism.

**AR'NAUTS.** *See* ALBANIA.

**ARNDT** (arnt), **Ernst Moritz.** German patriot and poet, was born 1769, died 1860. He was appointed professor of history at Greifswald in 1806, and stirred up the national feeling against Napoleon in his work *Geist der Zeit* (*Spirit of the Time*). In 1812-3 he zealously promoted the war of independence by a number of pamphlets, poems, and spirited songs, among which it is sufficient to refer to his *Was ist des Deutschen Vaterland? Der Gott, der Eisen wachsen liess*, and *Was blasen die Trompeten? Husaren, heraus!* which were caught up and sung from one end of Germany to the other. In 1817 he married a sister of the theologian Schleiermacher, and settled at Bonn in order to undertake the duties of professor of history. He was, however, suspended till 1840 on account of his liberal opinions, when he was restored to his chair on the accession of Frederick William IV.

**ARNDT, Johann.** Celebrated German mystic theologian, born 1555, died 1621. His principal work, *Wahres Christenthum* (True Christianity), is still popular in Germany, and has been translated into almost all European languages. Another of his publications is *Paradiesgaertlein*, translated into English (The Garden of Paradise).

**ARNE** (arn), **Thomas Augustine.** English composer, born at London, 1710, died 1778. His first opera, *Fair Rosamond*, was performed in 1733 at Lincoln's-Inn Fields, and was received with great applause. Then followed a version of Fielding's *Tom Thumb*, altered into *The Opera of Operas*, a musical burlesque. His style in the *Comus* (1738) is still more original and cultivated. To him we owe the national air *Rule, Britannia*, originally given in a popular piece called the *Masque of Alfred*. After having composed two oratorios and several operas he received the degree of Doctor of Music at Oxford. He composed, also, music for several of the songs in Shakespeare's dramas, and various pieces of instrumental music.

**ARNEE'.** One of then umerous Indian varieties of the buffalo (*Bubalus arni*), remarkable as being the largest animal of the ox kind known. It measures about 7 feet high at the shoulders, and from 9 to 10½ feet long from the muzzle to the root of the tail. It is found chiefly in the forests at the base of the Himalayas.

**ARN'HEM, or ARNHEIM.** A town in Holland, province of Gelderland, 18 miles south-west of Zutphen, on the right bank of the Rhine. Pleasantly situated, it is a favourite residential resort, and it contains many interesting public buildings; manufactures cabinet wares, mirrors, carriages, mathematical instruments, etc.; has paper-mills, and its trade is important. In 1795 it was stormed by the French, who were driven from it by the Prussians in 1813. Pop. 76,303 (1926).

**ARNHEM LAND.** A portion of the northern territory of S. Australia, lying west of the Gulf of Carpentaria, and forming a sort of peninsula.

**AR'NI.** A town of Madras, on the Cheyair River, 16 miles south of

Arcot; formerly a large military station; stormed by Clive in 1751, and scene of defeat of Hyder Ali by Sir Eyre Coote in 1782. Pop. 5050.

**AR'NICA.** A genus of plants, nat ord. Compositæ, containing eighteen species, one of which is found in Central Europe, *A. montāna* (leopard's bane or mountain tobacco), but is not a native of Britain. It has a perennial root, a stem about 2 feet high, bearing on the summit flowers of a dark golden yellow. In every part of the plant there is an acrid resin and a volatile oil, and in the flowers an acrid bitter principle called *arnicin*. The root contains also a considerable quantity of tannin. A tincture of it is employed as an external application to wounds and bruises. It was introduced into English gardens about the middle of the eighteenth century.

**AR'NIM, Elizabeth von.** A German writer, also known as Bettina, wife of Louis Achim von Arnim, and sister of the poet Clemens Brentano; born at Frankfort in 1785, died at Berlin 1859. Even in her childhood she manifested an inclination towards eccentricities and poetical peculiarities of many kinds. She entered into correspondence with Goethe, for whom she entertained a violent passion, although he was then in his sixtieth year.

In 1835 she published Goethe's *Briefwechsel mit einem Kinde* (Goethe's Correspondence with a Child), containing, among others, the letters that she alleged to have passed between her and Goethe. Her later writings dealt with subjects like the emancipation of the Jews, and the abolition of capital punishment. Her husband, Ludwig Achim von Arnim, born at Berlin in 1781, died 1831, distinguished himself as a writer of novels. In concert with her brother, Clemens Brentano, he published a collection of popular German songs and ballads entitled *Des Knaben Wunderhorn*. — Her daughter, Gisela von Arnim, is known in literature by her *Dramatische Werke* (3 vols., 1857-63).

**AR'NO** (ancient **ARNUS**). A river of Italy which rises in the Etruscan Apennines, makes a sweep to the south and then flows westwards, divides Florence into two parts, washes Pisa, and falls, 4 miles below it, into the Tuscan Sea, after a course of 130 miles.

**ARNO'BIUS.** An early Christian writer, was a teacher of rhetoric at Sicca Veneria, in Numidia, and in 303 became a Christian; he died about 326. He wrote seven books of *Disputationes adversus Gentes* (or *Adversus Nationes*), in which he refuted the objections of the heathens against Christianity. This work betrays a defective knowledge of Christianity, but is rich in materials for the understanding of Greek and Roman mythology.

**ARNOLD.** An urban district or town of England, Nottinghamshire, 3 miles north-east of Nottingham, with lace and hosiery manufactures, etc. It has a church built in the twelfth century, and a tower dating from the fifteenth century and restored. Pop. (1931), 14,470.

**AR'NOLD, Benedict.** A general in the American army during the War of Independence, born in 1741. He rendered his name infamous by his attempt to betray the strong fortress of West Point, with all the arms and immense stores which were there deposited, into the hands of the British. The project failed through the capture of Major André, when Arnold made his escape to the British lines. He received a commission as brigadier-general in the British army, and took part in several marauding expeditions. He subsequently settled in the West Indies, and ultimately came to London, where he died in 1801.

**AR'NOLD, Sir Edwin, K.C.I.E.** Poet, Sanskrit scholar and journalist, born 1832. Educated at Oxford, where he took the Newdigate prize for a poem entitled the *Feast of Belshazzar* in 1852, he was successively second master in King Edward VI.'s College at Birmingham, and principal of the Sanskrit College at Poonah in Bombay. In 1861 he joined the editorial staff of the *Daily Telegraph*, with which he was henceforth connected. He died in 1904. He was author of *Poems. Narrative and Lyrical*; translations from the Greek and Sanskrit; *The Light of Asia*, a poem on the life and teaching of Buddha; *The Light of the World*; *Pearls of the Faith*; *Lotus and Jewel*, etc.

**AR'NOLD, Matthew.** English critic, essayist, and poet, was born at Laleham, near Staines, 1822, being a son of Dr. Arnold of Rugby. He was educated at Winchester, Rugby and Oxford, and became a Fellow of Oriel College. He was private secretary to Lord Landsdowne, 1847-51; appointed inspector of schools, 1851; professor of poetry at Oxford, 1858; published *A Strayed Reveller and other poems*, 1848; *Empedocles on Etna*, 1853; *Merope*, 1858; *Essays in Criticism*, 1865; *On the Study of*

*Celtic Literature*, 1867; *Schools and Universities on the Continent*, 1868; *St. Paul and Protestantism*, 1870; *Literature and Dogma*, 1873; *Last Essays on Church and Religion*, 1877; *God and the Bible*, 1878; *Discourses on America*, 1885, etc. He received the degree of LL.D. from Edinburgh, and that of D.C.L. from Oxford, and lectured in Britain and in America. He died in 1888. A complete edition of his works in 15 vols. appeared in 1905.—BIBLIOGRAPHY: H. W. Paul, *Matthew Arnold* (English Men of Letters Series); G. Saintsbury, *Matthew Arnold* (Modern English Writers Series); G. W. E. Russell, *Matthew Arnold* (Literary Lives Series); F. Bickley, *Matthew Arnold and his Poetry*.

**AR'NOLD, Thomas.** Headmaster of Rugby School, and professor of modern history in the University of Oxford, born at Cowes, in the Isle of Wight, in 1795, died 1842. He entered Oxford in his sixteenth year, and in 1815 he was elected Fellow of Oriel College, and both in that year and 1817 he obtained the chancellor's prize for Latin and English essays. After taking deacon's orders he settled at Laleham, near Staines, where he employed himself in preparing young men for the universities. In 1828 he was appointed headmaster of Rugby School, and devoted himself to his new duties with the greatest ardour. While giving due prominence to the classics, he deprived them of their exclusiveness by introducing various other branches into his course, and he was particularly careful that the education which he furnished should be in the highest sense moral and Christian.

His success was remarkable. Not only did Rugby School become crowded beyond any former precedent, but the superiority of Dr. Arnold's system became so generally recognized that it may be justly said to have done much for the general improvement of the public schools of England. In 1841 he was appointed professor of modern history at Oxford, and delivered his introductory course of lectures with great success. His chief works are his edition of Thucydides, his *History of Rome* (unhappily left unfinished), and his *Sermons*. There is an admirable memoir of him by A. P. Stanley, Dean of Westminster (London, 2 vols., 1845).—Cf Lytton Strachey, *Eminent Victorians*.

**AR'NOLD OF BRESCIA.** An Italian religious and political reformer and martyr of the twelfth century. He was one of the disciples of Abélard, and attracted a considerable following by preaching against the corruption of the clergy. Excommunicated by Innocent II., he withdrew to Zürich, but soon reappeared in Rome, where he was taken and burned (1155).

**ARNOLD-FORSTER, Hugh Oakeley.** Grandson of Dr. Arnold of Rugby, and adopted son of the late W. E. Forster, M.P., whose wife was his aunt, was born in 1855, died in 1909.

He was educated at Rugby and University College, Oxford. He sat as member of Parliament for West Belfast from 1892, for Croydon from 1906, as a Liberal Unionist, was Parliamentary Secretary to the Admiralty from 1900 to 1903, then Secretary of State for War, a position which he held till Dec., 1905, having put forward sweeping proposals for the improvement of our army. He wrote on various subjects, especially books for popular instruction, including *How to Solve the Irish Land Question*, *The Citizen Reader*, *This World of Ours*, *Things New and Old*, *In a Conning Tower*, *A History of England*, *English Socialism of To-day*, *Military Needs and Military Policy*, etc.

**AR'NON.** A river in Palestine, the boundary between the country of the Moabites and that of the Amorites, afterwards of the Israelites, a tributary of the Dead Sea. It is now called Wady-el-Mojib.

**AR'NOT,** or **AR'NUT.** A name of the agreeably flavoured farinaceous tubers of the earth-nut or pig-nut (*Bunium flexuōsum* and *B. Bulbocastănum*). *See* EARTH-NUT.

**AR'NOTT, Dr. Neil.** An eminent physician and physicist, was born at Arbroath, 1788, died 1874. Having graduated as M.A. at Aberdeen, he then studied medicine, and was appointed a surgeon in the East India Company's naval service. In 1811 he commenced practice in London. In 1837 he was appointed extraordinary physician to the queen. In 1827 he published *Elements of Physics*, and in 1838 a treatise on *Warming and Ventilation*, etc.

He is widely known as the inventor of a stove which is regarded as one of the most economical arrangements for burning fuel, a ventilating chimney-valve, and his water-bed for the protection of the sick against bed-sores. In 1869 he gave £1000 to each of the four Scottish universities and £2000 to London University for the promotion of the study of physics. He was a strong advocate of a scientific as opposed to a purely classical education.

**ARNPRIOR.** A town of Canada, province Ontario, 35 miles west of Ottawa, on the right bank of the River Ottawa, where it is joined by the Madawaska, and with important railway connections. Pop. 4405.

**ARNSBERG** (ârnz'berh). A town in Prussia, province Westphalia, capital of the district of same name, on the Ruhr. Pop. 10,256.—The district of Arnsberg has an area of 2972 sq. miles, and a population of 2,400,000.

**ARNSTADT** (ârn'stât). A town of Germany, in Schwarzburg-Sondershausen, 11 miles south by west of Erfurt, upon the Gera, which divides it into two parts. It has manufactures in leather, etc., and a good trade in grain and timber. Pop. 17,907.

**ARNSWALDE** (ârnz'vâl-de). A town of Prussia, province Brandenburg, 39 miles south-east of Stettin. Pop. 8730.

**AR'NULF.** Great-grandson of Charlemagne, elected King of Germany in A.D. 887; invaded Italy, captured Rome, and was crowned emperor by the Pope (896); died A.D. 898.

**AROI'DEÆ.** *See* ARACEÆ.

**AR'OLSEN.** A German town, capital of Waldeck. Pop. 2793.

**AROMAT'ICS.** Drugs, or other substances which yield a fragrant smell, and often a warm pungent taste, as calamus (*Acŏrus Calămus*), ginger, cinnamon, cassia, lavender, rosemary, laurel, nutmegs, cardamoms, pepper, pimento, cloves, vanilla, saffron. Some of them are used medicinally as tonics, stimulants, etc.

**AROMATIC VINEGAR.** A very volatile and powerful perfume made by adding the essential oils of lavender, cloves, etc., and often camphor, to crystallizable acetic acid. It is a powerful excitant in fainting, languor, and headache.

**ARO'NA.** An ancient Italian town near the south extremity of Lago Maggiore. Pop. 4474. In the vicinity is the colossal statue of San Carlo Borromeo, 70 feet in height, exclusive of pedestal 42 feet high.

**AROOS'TOOK.** A river of the north-eastern United States and New Brunswick, a tributary of the St. John, length 120 miles.

**AROSA.** Pleasure resort of Switzerland. It is 19 miles from Coir, high amid the pine woods, which makes it suitable for consumptives.

**AROU'RA,** or **ARU'RA.** An ancient Egyptian measure of surface, according to Herodotus the square of 100 cubits, containing 21,904 sq. feet.

**ARPAD.** Founder of the Magyar monarchy, born about 870, died 907. *See* HUNGARY.

**ARPEGGIO** (ar-pej'ō). The distinct sound of the notes of an instrumental chord; the striking the notes of a chord in rapid succession, as in the manner of touching the harp instead of playing them simultaneously.

**ARPENT** (ar-păn). Formerly a French measure of land, equal to five-sixths of an English acre; but it varied in different parts of France; the Parisian arpent contained 32,400 sq. feet, the common arpent 40,000 sq. feet.

**ARPINO** (ar-pē'nō; ancient **ARPINUM**). A town of Southern Italy, province of Caserta, celebrated as the birthplace of Gaius Marius and Cicero. It manufactures woollens, linen, paper, etc. Pop. 10,309.

**ARQUA** (ar'kwâ). A village of Northern Italy, about 13 miles south-west of Padua, where the poet Petrarch died, 18th July, 1374. A monument has been erected over his grave. Pop. 1700.

**AR'QUEBUS.** A hand-gun; a species of firearm of the sixteenth century, resembling a musket. It was fired from a forked rest, and sometimes cocked by a wheel, and carried a ball that weighed nearly 2 ounces. A larger kind used in fortresses carried a heavier shot.

**ARRACA'CHA.** *See* ARACACHA.

**ARRACAN'.** *See* ARACAN.

**AR'RACK.** *See* ARACK.

**AR'RAGON.** *See* ARAGON.

**AR'RAH.** A town of British India, in Shahabad district, Bengal, rendered famous during the mutiny of 1857 by the heroic resistance of a body of twenty civilians and fifty Sikhs, cooped up within a detached house, to a force of 3000 sepoys, who were ultimately routed and overthrown by the arrival of a small European reinforcement. Pop. 46,170.

**ARRAIGNMENT** (ar-rān'-). The act of calling or setting a prisoner at the bar of a court to plead guilty or not guilty to the matter charged in an indictment or information. In Scots law the term is *calling the diet.*—The **Clerk of Arraigns** is an officer attached to assize courts and to the Old Bailey, who assists in the arraignment of prisoners, and puts formal questions to the jury.

**AR'RAN.** An island of Scotland,

in the Firth of Clyde, part of Bute county; length, north to south, 20 miles; breadth, about 10 miles; area, 165 sq. miles, or 105,814 acres, of which about 15,000 are under cultivation. It is of a wild and romantic appearance, particularly the northern half, where the island attains its loftiest summit in Goatfell, 2866 feet high. The coast presents several indentations, of which that of Lamlash, forming a capacious bay, completely sheltered by Holy Island, is one of the best natural harbours in the west of Scotland. On the small island of Pladda, about a mile from the south shore, a lighthouse has been erected.

**Geology.** The geology of Arran has attracted much attention, as furnishing within a comparatively narrow space distinct sections of the great geological formations; while the botany possesses almost equal interest, both in the variety and the rarity of many of its plants. Among objects of interest are relics of Danish forts, standing stones, cairns, etc. Lamlash and Brodick are villages. The island is a favourite resort of summer visitors, and is reached from Ardrossan. Pop. (1931), 4532.

**ARRAN, EARLS OF.** *See* HAMILTON, FAMILY OF.

**ARRANGEMENT.** In music, the adaptation of a composition to voices or instruments for which it was not originally written; also, a piece so adapted.

**AR'RAN ISLANDS.** *See* ARAN.

**ARRARO'BA.** *See* ARAROBA.

**ARRAS** (à-rä). A town of France, capital of the department Pas-de-Calais, well built, with several handsome squares and a citadel, cathedral, public library, botanic garden, museum, and numerous flourishing industries. In the Middle Ages it was famous for the manufacture of tapestry, to which the English applied the name of the town itself (arrazo). The battle of Arras was fought and Vimy Ridge taken by the Allies on 9th April, 1917. Pop. 24,200.

**ARREST'.** Is the apprehending or restraining of one's person, which, in civil cases, can take place legally only by process in execution of the command of some court or officers of justice; but in criminal cases any man may arrest without warrant or precept, and every person is liable to arrest without distinction, but no man is to be arrested unless charged with such a crime as will at least justify holding him to bail when taken. *Magna Charta* and the *Habeas Corpus Act* are the two great statutes for securing the liberty of the subject against unlawful arrests and suits.

**ARREST'MENT.** In Scots law, a process by which the arrester prevents the debtor in an obligation relating to movcables from fulfilling that obligation. It is used when the arrester is suing the creditor for a payment or when the arrester holds a decree against him. The arrester may thereafter obtain performance of the obligation in his own favour to the extent of his claim.

**ARREST OF JUDGMENT.** In law, the staying or stopping of a judgment after verdict, for causes assigned. Courts have power to arrest judgment for intrinsic causes appearing upon the face of the record; as when the declaration varies from the original writ; when the verdict differs materially from the pleadings; or when the case laid in the declaration is not sufficient in point of law to found an action upon.

**ARRE'TIUM.** *See* AREZZO.

**ARRHENATH'ERUM.** A genus of oat-like grasses, of which *A. elatius*, sometimes called French rye-grass, is a valuable fodder plant.

**ARRHENIUS, Svante August.** Famous Swedish physicist and chemist, born 19th Feb., 1859, at Wyk, near Upsala. He was educated at the Universities of Upsala (1876-81) and Stockholm (1881-4), spent two years in travelling, and after doing much original research was appointed professor of physics at the University of Stockholm. To him is due the establishment of the theory of electrolytic dissociation, supplying a reasonable explanation of many chemical phenomena otherwise insoluble. He subsequently extended the application of the electrolytic theory to the phenomena of atmospheric electricity. His dissertation *Sur la conductibilité galvanique des électrolytes* appeared in 1884. Among his other works is *Worlds in the Making* (English translation, 1908). He died in 1927.

**AR'RIA.** The heroic wife of a Roman named Cæcina Pætus. Pætus was condemned to death in A.D. 42 for his share in a conspiracy against the emperor Claudius, and was encouraged to suicide by his wife, who stabbed herself and then handed the dagger to her husband with the words, "It does not hurt, Pætus!"

**AR'RIAN, or FLAVIUS ARRIANUS.** A Greek historian, native of Nicomedia, flourished in the second century, under the emperor Hadrian

and the Antonines. He was first a priest of Ceres; but at Rome he became a disciple of Epictetus, was honoured with the citizenship of Rome, and was advanced to the senatorial and even consular dignities. His extant works are: *The Expedition of Alexander*, in seven books; a book *On the Affairs of India*; an *Epistle to Hadrian*; a *Treatise on Tactics*; a *Periplus of the Euxine Sea*; a *Periplus of the Red Sea*; and his *Enchiridion*, a moral treatise, containing the discourses of Epictetus.

**AR'RIS.** In architecture, the line in which the two straight or curved surfaces of a body, forming an exterior angle, meet each other.

**ARRO'BA** (Spanish). A weight formerly used in Spain, and still used in the greater part of Central and South America. In the States of Spanish origin its weight is generally equal to 25.35 lb. avoirdupois; in Brazil it equals 32.38 lb.—Also a measure for wine, spirits, and oil, ranging from 2¾ gallons to about 10 gallons.

**ARRÖE.** Danish Island. *See* AERÖE.

**ARRONDISSEMENT.** *See* FRANCE.

**ARROW.** *See* ARCHERY, BOW.

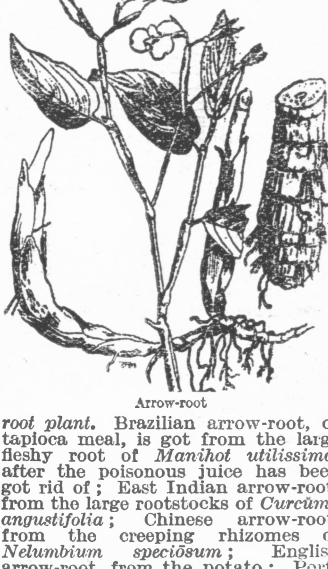
**ARROWHEAD** (Sagittaria). A genus of aquatic plants found in all parts of the world within the torrid and temperate zones, nat. ord. Alismaceæ, distinguished by possessing barren and fertile flowers, with a three-leaved calyx and three coloured petals. The common arrowhead (*S. sagittifolia*), the only native species in Britain, is known by its arrow-shaped leaves with lanceolate straight lobes.

**ARROWHEADED CHARACTERS.** *See* CUNEIFORM WRITING.

**ARROW LAKE.** An expansion of the Columbia River, in British Columbia, Canada; about 95 miles long from N. to S.; often regarded as forming two lakes, and referred to as Upper and Lower Arrow Lake.

**ARROW-ROOT.** A starch largely used for food and for other purposes. Arrow-root proper is obtained from the rhizomes or rootstocks of several species of plants of the genus Maranta (nat. ord. Marantaceæ), and perhaps owes its name to the scales which cover the rhizome, which have some resemblance to the point of an arrow. Some, however, suppose that the name is due to the fact of the fresh roots being used as an application against wounds inflicted by poisoned arrows, and others say that *arrow* is a corruption of *ara*, the Indian name of the plant.

The species from which arrow-root is most commonly obtained is *M. arundinăcea*, hence called the *arrow-*



Arrow-root

*root plant*. Brazilian arrow-root, or tapioca meal, is got from the large fleshy root of *Manihot utilissima*, after the poisonous juice has been got rid of; East Indian arrow-root, from the large rootstocks of *Curcūma angustifolia*; Chinese arrow-root, from the creeping rhizomes of *Nelumbium speciōsum*; English arrow-root, from the potato; Portland arrow-root, from the corms of *Arum maculātum*; and Oswego arrow-root, from Indian corn. Analyses made in 1902 and 1906 show that the idea generally held of the nourishing qualities of arrow-root is a delusion, and that the proteids, which are true muscle-builders, are present in an extremely small extent. Arrow-root, however, mixed with eggs, milk, and flavourings, is largely used in the dietary of invalids.

**ARROWSMITH, Aaron.** A distinguished English chartographer, born 1750, died 1823; he raised the execution of maps to a perfection it had never before attained.—His nephew, John, born 1790, died 1873, was no less distinguished in the same field; his *London Atlas of Universal Geography* may be specially mentioned.

**ARROYO** (ăr-rō'yo). The name of two towns of Spain, in Estremadura, the one, called Arroyo del Puerco (pop. 5727), about 10 miles west of

Caceres; the other, called Arroyo Molinos de Montanches, about 27 miles south-east of Caceres, memorable from the victory gained by Lord Hill over a French force under General Gerard, 28th Oct., 1811.

**AR'RU (or AROO) ISLANDS.** A group belonging to the Dutch, south of western New Guinea, and extending from north to south about 127 miles. They are composed of coralline limestone, nowhere exceeding 200 feet above the sea, and are well wooded and tolerably fertile. The natives belong to the Papuan race, and some of them are Christians. The chief exports are trepang, tortoise-shell, pearls, mother-of-pearl, and edible birds'-nests. Pop. of group about 20,000.

**ARSA'CES.** The founder of a dynasty of Parthian kings (256 B.C.), who, taking their name from him, are called Arsacidæ. There were thirty-one in all. *See* PARTHIA.

**AR'SAMAS.** A manufacturing town in the Russian government of Nijni-Novgorod, on the Tesha, 250 miles east of Moscow, with a cathedral and large convent. Pop. 12,000.

**AR'SENAL.** A royal or public magazine or place appointed for the making, repairing, keeping, and issuing of military stores. An arsenal of the first class should include factories for guns and gun-carriages, small-arms, small-arms ammunition, harness, saddlery, tents, and powder; a laboratory and large store-houses. In arsenals of the second class workshops take the place of the factories. The Royal Arsenal, Woolwich, which manufactures warlike implements and stores for the army and navy, was formed about 1720, and comprises factories, laboratories, etc., for the manufacture and final fitting up of almost every kind of arms and ammunition. Great quantities of military and naval stores are kept at the dockyards of Chatham, Portsmouth, Plymouth, and Pembroke.

In France there are various arsenals or depots of war-material, which is manufactured at Mézières, Toulouse, Besançon, etc.; the great naval arsenals are Brest and Toulon. Until 1919 the chief German arsenals were at Spandau, Strassburg, and Dantzig. The chief Austrian arsenal was the immense establishment at Vienna, which included gun-factory, laboratory, small-arms and carriage factories, etc. Russia had her principal arsenal at Petrograd, with supplementary factories of arms and ammunition at Briansk, Kiev, and elsewhere. In Italy Turin is the centre of the military factories. There are a number of arsenals in the United States, but individually they are of little importance.

**ARSENAL.** English football club playing the association game. It was founded by employees of Woolwich Arsenal in 1886 and for some years had a ground there. After the Great War it was moved to Highbury in N. London. In 1927 it reached the final of the Association Cup, which it won in 1930. In 1932 the Arsenal met Newcastle United in the final, Newcastle proving victors; score, 2 goals to 1.

**AR'SENIC** (symbol As, atomic weight 75). A common element usually found combined with metals as arsenides, the commonest of which is arsenical pyrites, FeAsS. It has a steel colour and high metallic lustre, and tarnishes on exposure to the air, first changing to yellow, and finally to black. In hardness it equals copper; it is extremely brittle, and very volatile, beginning to sublime before it melts. It burns with a blue flame, and emits a smell of garlic. Its specific gravity is 5.76. It forms compounds with most of the metals. Combined with sulphur it forms orpiment and realgar, which are the yellow and red sulphides of arsenic. Orpiment is the true *arsenicum* of the ancients. With oxygen arsenic forms two compounds, the more important of which is arsenious oxide, or arsenic trioxide ($As_4O_6$), which is the *white arsenic*, or simply *arsenic* of the shops. It is usually seen in white, glassy, translucent masses, and is obtained by sublimation from several ores containing arsenic in combination with metals, particularly from arsenical pyrites. Of all substances arsenic is that which has most frequently occasioned death by poisoning, both by accident and design. The best remedies against the effects of arsenic on the stomach are ferric hydroxide or magnesic hydroxide, or a mixture of both, with copious draughts of bland liquids of a mucilaginous consistence, which serve to procure its complete ejection from the stomach. Oils and fats generally, milk, albumen, wheat-flour, oatmeal, sugar or syrup, have all proved useful in counteracting its effect.

Like many other virulent poisons it is a safe and useful medicine, especially in skin diseases, when judiciously employed. It is used as a flux for glass, and also for forming pigments. The arsenite of copper (Scheele's green) and a double arsenite and acetate of copper (emerald green) were formerly largely used to colour paper-hangings for

rooms; but as poisonous gases are liable to be given off, the practice has been to a great extent abandoned. Arsenic compounds have been used for colouring confectionery, and other articles, bright green, but their chief industrial use is in the preparation of insecticides.

Arsenic is found in crude oil of vitriol, and occasionally in products such as grape-sugar, beer, etc., in the manufacture of which oil of vitriol is employed. Plants die when placed in a solution of arsenic, but corn is often steeped in such a solution, previous to planting, for preventing smut, and the growth of the future plant is not injured thereby.

**ARSHIN** (ar-shēn'). A Russian measure of length equal to 28 inches.

**ARSIN'OË.** A city of ancient Egypt on Lake Mœris, said to have been founded about 2300 B.C., but renamed after Arsinoë, wife and sister of Ptolemy II. of Egypt, and called also *Crocodilopolis*, from the sacred crocodiles kept at it.

**AR'SIS.** A term applied in prosody to that syllable in a measure where the emphasis is put; in elocution, the elevation of the voice, in distinction from *thesis*, or its depression. *Arsis* and *thesis*, in music, are the strong position and weak position of the bar, indicated by the down-beat and up-beat in marking time.

**AR'SON.** In English law, the malicious burning of a dwelling-house or outhouse of another man, which by the common law is felony, and which, if any person is therein, is capital. Also, the wilful setting fire to any church, chapel, warehouse, mill, barn, agricultural produce, ship, coal-mine, and the like. In Scotland it is called *wilful fire-raising*, and in both England and Scotland it is a considerable aggravation of the crime if the burning is to defraud insurers.

**ART.** In its most extended sense, as distinguished from nature on the one hand and from science on the other, has been defined as every regulated operation or dexterity by which organized beings pursue ends which they know beforehand, together with the rules and the result of every such operation or dexterity. Science consists in *knowing*, art in *doing*. In this wide sense it embraces what are usually called the useful arts. In a narrower and purely æsthetic sense it designates what are more specifically termed the fine arts, as architecture, sculpture, painting, music, and poetry. The useful arts have their origin in positive practical needs, and restrict themselves to satisfying them. The fine arts minister to the sentiment of taste through the medium of the beautiful in form, colour, rhythm, or harmony. *See* FINE ARTS, PAINTING, SCULPTURE, etc.—In the Middle Ages it was common to give certain branches of study the name of arts. Cf. A. C. R. Carter, *History of Art*, *The Year's Art*.

**ART COLLECTIONS.** *See* COLLECTIONS, ARTISTIC.

**ART, Teaching of.** With the advent of the present industrial age the teaching of art has undergone a profound change. The fine and the industrial arts have been equally affected. In mediæval times, and in the earlier classic ages, the system of apprenticeship prevailed, and all teaching of the arts and of the artistic crafts was given by masters of the various arts or trades to the apprentices who worked under their guidance as assistants. Standards of excellence were maintained by trade guilds, who enforced rules as to workmanship as well as rules for the economic conditions of each trade or craft. The painter of pictures, or of mural decorations, was trained in the same way as any other craftsman, working as an apprentice under a master.

When, in the last century, machinery driven by steam-power took the place of hand labour in industry, the small independent workships gradually disappeared, as the industrial centres increased in those localities where coal or raw material was most easily obtained; and, as the processes of each trade or craft became more and more subdivided and specialised, the old system of apprenticeship, which had become unnecessary, broke down. The teaching and tradition of the small independent craft workshops had no counterpart in the new centralized industrial systems. Even the painters of pictures needed no longer to prepare their own materials, for special industries arose, and mechanical processes were developed, for the work which formerly had been done in the artists' workshops by apprentices. The fine arts in this way suffered the loss of their old systems of teaching and instruction.

To meet the need for a revival of art teaching in the crafts and other industries, there arose a movement towards the centralization of teaching in schools of art during the latter half of the nineteenth century. Following the impulse given to that movement by the great exhibition in 1850, the British Government founded the schools of science and

art in London and in most of the important provincial towns. Earlier in the century bodies of artists had founded national academies for the teaching of art; and the teaching of drawing was gradually adopted as a part of ordinary school education. Step by step training in schools of art or technical schools took the place of the teaching formerly given during apprenticeship in every craft workshop. The ancient guilds were replaced by the new trades unions, but these took no part in the maintenance of artistic standards nor of quality in workmanship.

At the present time the teaching of art begins with the early school lessons in drawing, and is carried on in special technical classes or schools of art, where teachers of the "fine arts" and of the artistic crafts give instruction to students preparing for professional work. In a few of the artistic trades the system of apprenticeship still survives, but the teaching given by that means is usually supplemented by attendance at a school of art or technical school. Under the Education Act of 1918 attendance at technical classes in the daytime became compulsory for apprentices in all industrial trades.

The subject of art teaching was formerly disregarded by the universities, but has become definitely within their province since the founding of the Slade professorships at Oxford, Cambridge, and London Universities, and of the professorship of fine art at the University of Edinburgh.

The chief schools of art in Great Britain are the schools of the Royal Academy in London, the Slade School at University College, London, and the Royal College of Art at South Kensington, also the Central School of Arts and Crafts, and the other large metropolitan schools of the London County Council.

In most of the English provincial towns are municipal or other schools of art under the control of the Board of Education.

In Scotland the chief schools are the four central institutions—the Edinburgh College of Art, and the schools of art of Glasgow, Aberdeen, and Dundee. In each of these a diploma is given on the satisfactory completion of a prescribed course of study.

In Ireland the chief schools are those of the Royal Hibernian Academy in Dublin, and the provincial schools of art under the Department of Agriculture and Technology.

On the Continent the chief centre of artistic training has for many years been in Paris. Advanced students from most European and American art schools spend some of the later period of their study in the schools of Paris, in painting, in sculpture, or in architecture. There is, naturally, a valuable incentive and stimulation due to this gathering together of advanced students from all countries, as well as to the high academic tradition and sense of style of the French.

**"Atelier" System.** The "atelier" system, which is followed in the French schools, is simple and personal. The expenses of an "atelier," or studio, are borne by a group of students by the consent and under the guidance of an artist of reputation, who visits the "atelier" at stated intervals, but is not concerned in its administration. In this way the relations between the professor and his pupils are extremely direct and personal. Most of the distinguished artists of Paris are attached to some "atelier" to which chosen pupils are admitted.

There are also in Paris excellent schools for training in the applied arts, schools for furniture-making, printing, jewellery, and other artistic trades. These are on private foundations, but also receive State aid.

The teaching of art that is given at the present day as a part of ordinary general education attempts little more than a training in the elements of drawing, with some practice in the use of colour. The purpose of the drawing lesson is the attainment of skill in the representation of objects rather than the training of the æsthetic sense, or of artistic judgment or taste.

In the schools of art opportunities are provided for training in drawing and painting, sculpture, and architecture, and in the general principles of design in these arts, and in many of the artistic crafts and industrial processes. In some localities, where particular industries or artistic trades are concentrated, special schools for artistic and technical training are provided. The present tendency is towards the development of special schools for particular artistic trades or professions.

A complete system of training in any art must of necessity include: (1) actual technical practice; (2) teaching of the canons of workmanship of the art; (3) acquaintance with its historical development, especially with the notable examples and the highest achievements of past masters in the art.

**ARTA** (ancient **AMBRACIA**). A gulf, town, and river of north-western Greece. The town was transferred by Turkey to Greece in 1881 (pop.

8000). It stands on the River Arta, which for a considerable distance above its mouth formed a part of the boundary between Greece and Turkey.—The province of Arta has an area of 395 sq. miles, and a pop. of 53,051.

**ARTAXERX'ES** (Old Pers. *Artakhsathra*, "the mighty"). The name of several Persian kings: (1) **Artaxerxes**, surnamed Longimanus, succeeded his father Xerxes I., 465 B.C. He subdued the rebellious Egyptians, terminated the war with Athens, governed his subjects in peace, and died 425 B.C.—(2) **Artaxerxes**, surnamed Mnemon, succeeded his father Darius II. in the year 405 B.C. After having vanquished his brother Cyrus he made war on the Spartans, who had assisted his enemy, and forced them to abandon the Greek cities and islands of Asia to the Persians. On his death, 359 B.C., his son Ochus ascended the throne under the name of—(3) **Artaxerxes Ochus** (359 to 339 B.C.). After having overcome the Phœnicians and Egyptians, and displayed great cruelty in both countries, he was poisoned by his general Bagoas.

**ARTE'DI, Peter.** A Swedish naturalist, born 1705, drowned at Amsterdam, 1735. He studied at Upsala, turned his attention to medicine and natural history, and was a friend of Linnæus. His *Bibliotheca Ichthyologica* and *Philosophia Ichthyologica*, together with a life of the author, were published at Leyden in 1738.

**ARTEL.** A name for co-operative associations in Russia. These associations were known in ancient Russia as *drushina* or *wataga*. The artels originally consisted of bodies of men associating for the purpose of jointly undertaking a piece of work and dividing the profits. Artels were formed in the thirteenth and fourteenth centuries for the co-operation of their members in hunting and fishing. Inspired and stimulated by the Schulze-Delitzsch associations established in Germany, the Russian artels have extended their activity to various branches of industrial life. There are now consum artels, credit artels, and insurance artels, but the most important are the artisan and industrial artels. Some of the artels, however, are little more than trade guilds with mutual responsibility.

**AR'TĔMIS.** An ancient Greek divinity, identified with the Roman Diana. She was the daughter of Zeus (Jupiter) and Leto or Latona, and was the twin sister of Apollo, born in the Island of Delos. She is variously represented as a huntress, with bow and arrows; as a goddess of the nymphs, in a chariot drawn by four stags; and as the moon-goddess, with the crescent of the moon above her forehead.

She was a maiden divinity, never conquered by love, except when Endymion made her feel its power. She demanded the strictest chastity from her worshippers, and she is represented as having changed Actæon into a stag, and caused him to be torn in pieces by his own dogs, because he had secretly watched her as she was bathing. The Artemisia was a festival celebrated in her honour at Delphi. The famous temple of Artemis at Ephesus was considered one of the wonders of the world, but the goddess worshipped there was very different from the huntress goddess of Greece, being of Eastern origin, and regarded as the symbol of fruitful nature.

**ARTEMI'SIA.** Queen of Caria, in Asia Minor, about 352-350 B.C., sister and wife of Mausōlus, to whom she erected in her capital, Halicarnassus, a monument, called the Mausolēum, which was reckoned among the seven wonders of the world.

**ARTEMI'SIA.** A genus of plants of numerous species, nat. ord. Compositæ, comprising mugwort, southernwood, and wormwood. Certain alpine species are the flavouring ingredient in absinthe. *See* WORMWOOD.

**ARTEMI'SIUM.** A promontory in Eubœa, an island of the Ægean, near which several naval battles between the Greeks and Persians were fought, 480 B.C.

**AR'TEMUS WARD.** *See* BROWNE, CHARLES FARRAR.

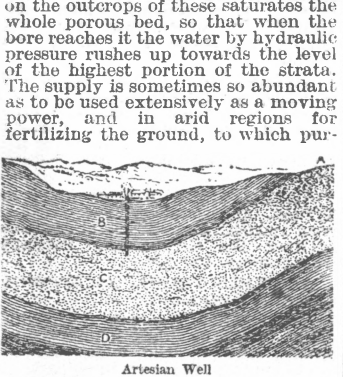
**AR'TERIES.** The system of cylindrical vessels or tubes, membranous, elastic, and pulsatile, which convey the blood from the heart to all parts of the body, by ramifications which, as they proceed, diminish in size and increase in number, and terminate in minute capillaries uniting the ends of the arteries with the beginnings of the veins. There are two principal arteries or arterial trunks: the *aorta*, which rises from the left ventricle of the heart and ramifies through the whole body, sending off great branches to the head, neck, and upper limbs, and downwards to the lower limbs, etc.; and the *pulmonary artery*, which conveys venous blood from the right ventricle to the lungs, to be purified in the process of respiration.

**ARTERIO-SCLEROSIS.** Disease characterised by the thickening and

hardening of the coats of the arteries. It may arise from excessive indulgence in alcohol, or from gout, while syphilis is also a cause. To some extent it comes on with advancing years. It may lead to death from heart disease, or apoplexy.

**ARTERIOT'OMY.** The opening or cutting of an artery for the purpose of blood-letting, as, for instance, to relieve pressure of the brain in apoplexy.

**ARTE'SIAN WELLS.** So called from the French province of Artois, where they appear to have been first used on an extensive scale, are perpendicular borings into the ground through which water rises to the surface of the soil, producing a constant flow or stream, the ultimate sources of supply being higher than the mouth of the boring, and the water thus rising by the well-known law. They are generally sunk in valley plains and districts where the lower pervious strata are bent into basin-shaped curves. The rain falling on the outcrops of these saturates the whole porous bed, so that when the bore reaches it the water by hydraulic pressure rushes up towards the level of the highest portion of the strata. The supply is sometimes so abundant as to be used extensively as a moving power, and in arid regions for fertilizing the ground, to which purpose artesian springs have been applied from a very remote period.




Artesian Well

A. Outcrops of pervious stratum (C) acting as collecting areas. B and D. Impervious stratum.

Thus many artesian wells have been sunk in the Algerian Sahara, which have proved an immense boon to the district. The water of most of these is potable, but a few are a little saline, though not to such an extent as to influence vegetation. The hollows in which London and Paris lie are both perforated in many places by borings of this nature. At London they were first sunk only to the sand, but afterwards into the chalk.

One of the most celebrated artesian wells is that of Grenelle, near Paris, 1798 feet deep, completed in 1841, after eight years' work. Artesian wells are now common in many countries, and have been sunk to the depth of a mile or more. As the temperature of water from great depths is invariably higher than that at the surface, artesian wells have been made to supply warm water for heating manufactories, greenhouses, hospitals, fish-ponds, etc.

They have also been made in the United States and Australia for the purpose of irrigation. Petroleum wells are generally of the same technical description. Artesian wells are now made with larger diameters than formerly, and altogether their construction has been rendered much more easy in modern times. *See* BORING.

**ARTEVELD,** or **ARTEVELDE** (är'te-velt, är'te-vel-de). The name of two men distinguished in the history of the Low Countries.—(1) **Jacob van,** a brewer of Ghent, born about 1300, was selected by his fellow-townsmen to lead them in their struggles against Count Louis of Flanders. In 1338 he was appointed captain of the forces of Ghent, and for several years exercised a sort of sovereign power. A proposal to make the Black Prince, son of Edward III. of England, Governor of Flanders led to an insurrection in which Arteveld lost his life (1345).—(2) **Philip,** son of the former, at the head of the forces of Ghent gained a great victory over the Count of Flanders, Louis II., and for a time assumed the state of a sovereign prince.

His reign proved short-lived. The Count of Flanders returned with a large French force, fully disciplined and skilfully commanded. Arteveld was rash enough to meet them in the open field at Roosebeke, between Courtrai and Ghent, in 1382, and fell with 25,000 Flemings.

**ARTHRI'TIS** (Gr. *arthron,* a joint). Any inflammatory distemper that affects the joints, particularly chronic rheumatism or gout.

**ARTHRO'DIA.** A species of articulation, in which the head of one bone is received into a shallow socket in another; a ball-and-socket joint.

**ARTHROP'ODA.** One of the two primary divisions (Anarthropoda being the other) into which modern naturalists have divided the subkingdom Annulosa, having the body composed of a series of segments, some always being provided with articulated appendages. The division comprises Crustaceans, Spiders, Scorpions, Centipedes, and Insects.

**ARTHROZO'A.** A name some-

times given to all articulated animals, including the arthropoda and worms.

**ARTHUR, Chester Alan.** Twenty-first President of the United States, born 1830, died 1886, was the son of Scottish parents, his father being pastor of Baptist churches in Vermont and New York. He chose law as a profession, and practised in New York. As a politician he became a leader in the Republican party. During the civil war he was energetic as quartermaster-general of New York in getting troops raised and equipped. He was afterwards collector of customs for the port of New York. In 1880 he was elected Vice-President, succeeding as President on the death of Garfield in 1881.

**AR'THUR, King.** An ancient British hero of the sixth century, son of Uther Pendragon and the Princess Igerna, wife of Gorlois, Duke of Cornwall. He married Guinevere, or Ginevra; established the famous order of the Round Table; and reigned, surrounded by a splendid Court, twelve years in peace. After this, as the poets relate, he conquered Denmark, Norway, and France, slew the giants of Spain, and went to Rome. From thence he is said to have hastened home on account of the faithlessness of his wife, and Modred, his nephew, who had stirred up his subjects to rebellion. He subdued the rebels, but died in consequence of his wounds, on the Island of Avalon.

The story of Arthur is supposed to have some foundation in fact, and has ever been a favourite subject with our romanticists and our poets. It is generally believed that Arthur was one of the last great Celtic chiefs who led his countrymen from the west of England to resist the settlement of the Saxons in the country. But many authorities regard him as a leader of the Cymry of Cumbria and Strath-Clyde against the Saxon invaders of the east coast and the Picts and Scots north of the Forth and the Clyde. *See* GRAIL, MERLIN, ROUND TABLE. — BIBLIOGRAPHY: J. Rhys, *Studies in the Arthurian Legend*; W. Lewis Jones, *King Arthur in History and Legend*.

**ARTHUR'S SEAT.** A picturesque hill within the King's Park in the immediate vicinity of Edinburgh; has an altitude of 822 feet; descends rollingly to the N. and E. over a base each way of about five furlongs; presents an abrupt shoulder to the S., and breaks down precipitously to the W. It is composed of a diversity of eruptive rocks, with some interposed and uptilted sedimentary ones; and derives its name somehow from the legendary King Arthur.

**AR'TIAD** (Gr. *artios*, even-numbered). In chemistry, a name given to an element of even equivalency, as a dyad, tetrad, etc.: opposed to a perissad, an element of uneven equivalency, such as a monad, triad, etc.

**ARTICHOKE** (*Cynăra Scolȳmus*). Sometimes called "the Globe Artichoke," a well-known plant of the nat. ord. Compositæ, somewhat resembling a thistle, with large divided prickly leaves. The erect flower-stem terminates in a large round head of numerous imbricated oval spiny scales which surround the flowers. The fleshy bases of the scales with the large receptacle are the parts that are eaten. Artichokes were introduced into England early in the sixteenth century. The Jerusalem artichoke (a corruption of the It. *girasole*, a sunflower), or *Helianthus tuberōsus*, is a species of sunflower, whose roots are used like potatoes; it was introduced into England in the early part of the seventeenth century.

**ARTICLE.** In grammar, a part of speech used before nouns to limit or define their application. In English *a* or *an* is usually called the indefinite article (the latter form being used before a vowel sound), and *the*, the definite article, but they are also described as adjectives. *An* was originally the same as *one*, and *the* as *that*. In Latin there were no articles, and Greek has only the definite article.

**ARTICLES, LORDS OF THE.** In Scottish history, a committee chosen equally from each estate or division of Parliament to prepare the various measures, which, when completed, were laid before the Parliament for adoption or rejection. They were first appointed in 1369, and gradually became a recognised part of the Scottish legislative machinery. Abolished 1690.

**ARTICLES, THE SIX.** In English ecclesiatical history, articles imposed by a statute (often called the Bloody Statute) passed in 1541, the thirty-third year of the reign of Henry VIII. They decreed the acknowledgment of transubstantiation, the sufficiency of communion in one kind, the obligation of vows of chastity, the propriety of private masses, celibacy of the clergy, and auricular confession. Acceptance of these doctrines was made obligatory on all persons under the severest penalties; the Act, however, was relaxed in 1544, and repealed in 1549.

**ARTICLES, THE THIRTY-NINE.** Of the Church of England, a statement of the particular points of doctrine, thirty-nine in number, maintained by the English Church; first promulgated by a convocation held in London in 1562-3, and confirmed by royal authority; founded on and superseding an older code issued in the reign of Edward VI. The first five articles contain a profession of faith in the Trinity; the incarnation of Jesus Christ, His descent to hell, and His resurrection; the divinity of the Holy Ghost. The three following relate to the canon of the Scripture. The eighth article declares a belief in the Apostles', Nicene, and Athanasian creeds. The ninth and following articles contain the doctrine of original sin, of justification by faith alone, of predestination, etc.

The nineteenth, twentieth, and twenty-first declare the Church to be the assembly of the faithful; that it can decide nothing except by the Scriptures. The twenty-second rejects the doctrine of purgatory, indulgences, the adoration of images, and the invocation of saints. The twenty-third decides that only those lawfully called shall preach or administer the sacraments. The twenty-fourth requires the liturgy to be in English. The twenty-fifth and twenty-sixth declare the sacraments effectual signs of grace (though administered by evil men), by which God excites and confirms our faith. They are two: baptism and the Lord's supper. Baptism, according to the twenty-seventh article, is a sign of regeneration, the seal of our adoption, by which faith is confirmed and grace increased.

In the Lord's supper, according to article twenty-eight, the bread is the communion of the body of Christ, the wine the communion of His blood, but only through faith (article twenty-ninth); and the communion must be administered in both kinds (article thirty). The twenty-eighth article condemns the doctrine of transubstantiation, and the elevation and adoration of the host; the thirty-first rejects the sacrifice of the mass as blasphemous; the thirty-second permits the marriage of the clergy; the thirty-third maintains the efficacy of excommunication.

The remaining articles relate to the supremacy of the king, the condemnation of Anabaptists, etc. They were ratified anew in 1604 and 1628. All candidates for ordination must subscribe these articles, but they are not binding upon laymen, except judges and certain university officials. This formulary is now accepted by the Episcopalian Churches of Scotland, Ireland, and America.

**ARTICLES OF ASSOCIATION.** Are the rules framed by a company for the administration of its affairs. Public companies usually have separate articles of their own, but this is not essential. When a registered company has no articles, its business procedure is regulated by the statutory form, found in Schedule 1 of the Companies (Consolidation) Act, 1908, and known as Table A. When separate articles are used they must be printed, signed, stamped, and filed along with the memorandum of association. Unlike the memorandum, the articles may be altered at any time, by special resolution, provided the alteration is within the powers given by the memorandum. Thus, where preferred shares are created by the memorandum, their privileges are more secure than if merely issued under the articles.

The articles are intended merely for internal administration, and, while binding in questions between the company and its members as such, they do not affect third parties, unless the company has acted *ultra vires* and this was discoverable from the articles, which the public can inspect at a nominal fee.—BIBLIOGRAPHY: Sir F. B. Palmer, *Company Law*; A. Coles, *Guide for the Company Secretary*; A. F. Topham, *Principles of Company Law*.

**ARTICLES OF WAR.** *See* MILITARY LAW.

**ARTICULA'TA.** The third great section of the animal kingdom according to th arrangement of Cuvier, applied to invertebrates such as insects and worms, in which the body displays a jointed structure. The name is now obsolete. *See* ARTHROPODA.

**ARTICULA'TION.** In anatomy a joint; the joining or juncture of the bones. This is of three kinds: (1) *Diarthrōsis*, or a movable connection, such as the ball-and-socket joint; (2) *Synarthrōsis*, immovable connection, as by suture, or junction by serrated margins; (3) *Symphysis*, or union by means of another substance, by a cartilage, tendon, or ligament.

**ARTIFICIAL LIMBS.** Artificial limbs of a primitive kind have been in use from very early times; but, as the material of which they were made was perishable, few specimens have been preserved. In the museum of the Royal College of Surgeons in London there is a good specimen of a Roman artificial leg which is believed to date back to the third

century B.C. This leg is made of wood, covered with thin bronze; it has an iron sole-plate, and was fastened on by means of a waist-belt.

In Irish legend we are told of Nuada, who led the tribe of the Dananns back to Ireland, having an artificial hand made of silver; from this he received the name of Argetlam or Silver-handed. In mediæval times Goetz von Berlichingen, who lost his right hand at the siege of Landshut (1505), had a hand made of iron to supply its place.

Great improvements have been made in the manufacture of artificial limbs during the last fifty years. After the Franco-Prussian war the French Government adopted an artificial arm and hand known as the "Beaufort" and issued it to the soldiers who required it. This hand had a movable thumb controlled by a cord passing up the arm and fastened to a loop band over the opposite shoulder.

An Englishman named Heather Bigg invented a hand with a movable thumb which was worked by a piston and controlled by a rubber ball fastened under the arm-pit. These designs have been improved upon from time to time, and an artificial hand can now be made which is capable of opening and closing at will, and of lifting and holding light articles.

Artificial legs vary in design, from the simple pin leg to ingenious contrivances such as the "Anglesey" leg, which is made of seasoned willow wood with steel ankles and knee-joints. This "Anglesey" leg is the standard best-quality limb in Great Britain. The German artificial-limb makers use leather instead of wood. These leather legs fit comfortably, but are too heavy.

**ARTIFICIAL RESPIRATION.** A method of resuscitation of a person whose respiratory function is suspended, as in cases of drowning, narcotic poisoning, the effects of noxious fumes, collapse, or the asphyxia of new-born children. In Sylvester's method the patient is placed on his back on the floor and his arms raised above his head, pulled forward and downward to expand and contract the chest alternately, but Schäfer's method is more generally adopted now as being more effective. The patient is laid face downwards with arms extended and the face turned to one side. The operator kneels across the body, with the hands flat over the lowest ribs. He then throws the weight of his body slowly and gradually on to his hands, then raises his body slowly, removing the pressure, but without removing his hands. This movement is repeated twelve times a minute without pause. In severe cases two hours' work may be necessary.

**ARTIFICIAL SILK.** *See* SILK, ARTIFICIAL.

**ARTILLERY.** All ordnance such as guns and howitzers as opposed to small arms and machine-guns. The term is also used for the troops who serve these arms.

Generally speaking, artillery is divided into field, heavy, and siege artillery. For details of organization see ARMY. The earliest form of artillery was a metal tube which was placed in a convenient position on the ground. The charge of gunpowder was ignited by placing a match to a hole bored at the closed end, and the resulting explosion forced the projectile—a stone—more or less in the required direction. Later on this primitive weapon was provided with wheels. In another form one man fired it while a second man supported it on his shoulder. In the later Middle Ages guns of various calibres were known by the names of birds of prey or reptiles; among such were falcons and falconets, culverins and demi-culverins.

The fourteenth century saw the development of artillery for siege purposes—chiefly by the Germans—and in the next century it began to be employed in open warfare; while in 1537 the present Honourable Artillery Company was formed in London to encourage the use of all "weapons of volley." These weapons of volley were not even confined to firearms, but included bows and cross-bows. The earliest English troops raised as artillery personnel were called the Regiment of Firelocks. Of late years artillery science had made almost inconceivable progress, thanks to which, *inter alia*, it is no longer necessary for the target to be visible from the gun-position. This fact, combined with the use of smokeless powder, makes the locating of hostile batteries exceedingly difficult.

All field artillery, by which is meant guns and howitzers, which accompany mobile troops are designed on the quick-firing principle, by which the inevitable recoil at the moment of firing is absorbed by an arrangement known as the recoil-carriage, thus preventing any movement of the gun-carriage proper, and avoiding unnecessary labour for the gun-detachments, while at the same time allowing the men composing it to remain under cover of the shield with which the guns are provided.

With the quick-firing gun, propellent and projectile are combined in one cartridge similar to that in use with small arms; with the howitzer they are separated. This difference is due to the fact that whereas guns are designed for a flat trajectory with a deep zone of fire-effect, howitzers are intended for high-angle fire with an almost vertical fall of shrapnel-bullets. This effect is produced by varying the charge for different ranges. A field battery consists of 6 guns or howitzers and 12 ammunition-wagons. Both guns and wagons are of the limbered type, i.e. in two detachable parts, and the weight behind the team of an English gun is approximately 2 tons.

As to tactical principles, it is recognized that the function of artillery is to assist the other arms, that it cannot by itself win a battle, and that its true *métier* is to prepare the way for and assist the infantry. During 1914-18 some 700,000 officers and men served with the Royal Regiment.

**ARTILLERY COMPANY, THE HONOURABLE.** The oldest existing body of volunteers in Great Britain, instituted in 1537, revived in 1610. It comprises six companies of infantry, besides artillery, and furnishes a guard of honour to the sovereign when visiting the city of London. Previous to 1842 the Company elected their own officers, but since that date they have been appointed by the Crown.

**ARTILLERY SCHOOLS.** Institutions established for the purpose of giving a special training to the officers, and in some cases the men, belonging to the artillery service. In Great Britain the artillery schools are at Woolwich and Shoeburyness. The Department of Artillery studies at Woolwich give artillery officers the means of continuing their studies after they have completed the usual course at the Royal Military College, and of qualifying for appointments requiring exceptional scientific attainments.

The School of Gunnery at Shoeburyness gives instruction in gunnery to officers and men, and conducts all experiments connected with artillery and stores. The sands at the mouth of the Thames afford ample opportunity for artillery practice and firing at long ranges. The Royal Artillery Institution at Woolwich contains a museum, lecture-room, and printing-press, from which professional and scientific papers are periodically issued.

**ARTIODACTYLA** (Gr. *artios*, even numbered, *daktylos*, a finger or toe). A section of the Ungulata or hoofed mammals, comprising all those in which the number of the toes is even (two or four), including the ruminants, such as the ox, sheep, deer, etc., and also a number of non-ruminating animals, as the hippopotamus and the pig.

**ARTISANS' AND LABOURERS' DWELLINGS ACT.** An English Act of Parliament passed in 1868 to empower town councils and other local authorities to demolish or improve dwellings unfit for human habitation, and to build and maintain better dwellings in lieu thereof. Other Acts for the same object were passed in 1875, 1879, and 1882. *See* HOUSING.

**ARTOCARPACEÆ.** A nat. ord. of plants, the bread-fruit order, by some botanists ranked as a sub-order of the Urticaceæ or nettles. They are trees or shrubs, with a milky juice, which in some species hardens into caoutchouc, and in the cow-tree (*Brosimum Galactodendron*) is a milk as good as that obtained from the cow. Many of the plants produce an edible fruit, of which the best known is the bread-fruit (Artocarpus).

**ARTOIS** (ár-twä). A former province of France, anciently one of the seventeen provinces of the Netherlands, now almost completely included in the department of Pas-de-Calais.

**ARTOIS, THE BATTLE OF.** *See* EUROPEAN WAR.

**ARTS.** The name given to certain branches of study in the Middle Ages, originally called the "liberal arts" to distinguish them from the "servile arts" or mechanical occupations. These arts were usually given as grammar, dialectics, rhetoric, music, arithmetic, geometry, and astronomy. Hence originated the terms "art classes," "degrees in arts," "Master of Arts," etc., still in common use in universities, the faculty of arts being distinguished from those of divinity, law, medicine, or science. *See* UNIVERSITY.

**ARTSYBASHEV, Mikhail.** Russian author, born in 1878. After a number of short stories he wrote, at the age of twenty-five, a novel entitled *Sanin*, published in 1907, which placed him at once among the most famous contemporary Russian authors. Whatever opinion literary critics may hold of this novel, his wonderful realism, simplicity of style, and psychological analysis cannot be disputed. He died in 1927.

**ART UNIONS.** Associations for encouraging art, an object which

they mainly pursue by disposing of pictures, sculptures, etc., by lottery among subscribers. They seem to have originated in France during the time of Napoleon I. They soon afterwards took root in Germany, where they have been very successful. The first art union established in Britain was that at Edinburgh in 1834. Art unions were legalized by the Art Unions Act, 1846. *See* LOTTERY.

**ARTVIN.** A town in the Republic of Georgia, in the Caucasus, about 35 miles inland from Batum. Pop. 6720.

**ARUBA** (à-rō'bà). An island off the north coast of Venezuela, belonging to Holland (a dependency of Curaçoa), about 30 miles long and 7 broad; surface generally rock, quartz being abundant, and containing considerable quantities of gold; a phosphate which is exported for manure is also abundant. The climate is healthy. Pop. 9481.

**ARU ISLANDS.** *See* ARRU ISLANDS.

**A'RUM.** A genus of plants, nat. ord. Araceæ. *A. maculātum* (the common wake-robin, lords-and-ladies, or cuckoo pint) is abundant in woods and hedges in England and Ireland, but is rare in Scotland. It has acrid properties, but its corn yields a starch which is known by the name of Portland sago or arrowroot. At one time this was prepared to a considerable extent in Portland Island. All the species of this genus develop much heat during flowering.

**AR'UNDEL.** A town in Sussex, England, on the River Arun, 4 miles from its mouth, the river being navigable to the town for vessels of 250 tons. The castle of Arundel, the chief residence of the dukes of Norfolk, stands on a knoll on the north-east side of the town. Pop. (1931), 2489.

**AR'UNDEL, Thomas.** Third son of Richard Fitz-Alan, Earl of Arundel, born 1352, died 1413. He was Chancellor of England and Archbishop of Canterbury. He concerted with Bolingbroke to deliver the nation from the oppression of Richard II., and was a bitter persecutor of the Lollards and followers of Wycliffe.

**ARUNDELIAN MARBLES.** A series of ancient sculptured marbles discovered by William Petty, who explored the ruins of Greece at the expense of and for Thomas Howard, Earl of Arundel, who lived in the time of James I. and Charles I., and was a liberal patron of scholarship and art. After the Restoration they were presented by the grandson of the collector to the University of Oxford. Among them is the *Parian Chronicle*, a chronological account of the principal events in Grecian, and particularly in Athenian, history, during a period of 1186 years, from the reign of Cecrops (1450 B.C.) to the archonship of Diognetus (264 B.C.)

**ARUN'DO.** *See* PHRAGMITES.

**ARUSPICES** (a-rus'pi-sēz), or **HARUSPICES.** A class of priests in ancient Rome, of Etrusian origin, whose business was to inspect the entrails of victims killed in sacrifice, and by them to foretell future events.

**ARUWIMI.** A large river of equatorial Africa, a tributary of the Congo, on the north bank.

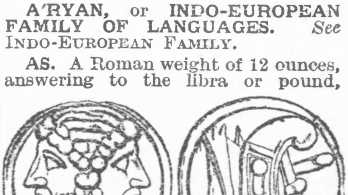
**ARVAL BROTHERS** (*Fratres Arvāles*). A college or company of twelve members elected for life from the highest ranks in ancient Rome, so called from offering annually public sacrifices for the fertility of the fields (Lat. *arvum*, a field).

**ARVE** (ärv). A river rising in the Savoyan Alps, passes through the valley of Chamonix, and falls into the Rhone near Geneva, after a course of about 50 miles.

**ARVIC'OLA.** A genus of rodent animals, sub-ord. Muridæ or Mice. There are three British species. *A. amphibia* is the water-vole (or water-rat), and *A. agrestis* is the field-vole or short-tailed field-mouse. They are prolific animals, having three or four litters in the year, each consisting of from four to ten young.

**A'RYAN, or INDO-EUROPEAN FAMILY OF LANGUAGES.** *See* INDO-EUROPEAN FAMILY.

**AS.** A Roman weight of 12 ounces, answering to the libra or pound,



As—Specimen in British Museum

and equal to 237.5 grains avoirdupois, or 327.1873 grammes French measure. In the most ancient times of Rome the copper or bronze coin which was called *as* actually weighed an *as*, or a pound, but in 264 B.C. it was reduced to 2 ounces, in 217 to 1 ounce, and in 191 to ½ ounce.

**A'SA.** Great grandson of Solomon

and third King of Judah: he ascended the throne at an early age, and distinguished himself by his zeal in rooting out idolatry with its attendant immoralities. He died after a prosperous reign of forty-one years.

**ASAFE'TIDA,** or **ASAFŒTIDA.** A fetid inspissated sap from Central Asia, the solidified juice of the *Narthex Asafetida*, a large umbelliferous plant. It is used in medicine as an anti-spasmodic, and in cases of flatulency, in hysteric paroxysms, and other nervous affections. Notwithstanding its very disagreeable odour it is used as a seasoning in the East, and sometimes in Europe. An inferior sort is the product of certain species of Ferula.

**ASAGRÆ'A.** *See* SABADILLA.

**ASA'MA.** An active volcano of Japan, about 50 miles north-west of Tokio, 8260 feet high.

**A'SAPH.** A Levite and psalmist appointed by David as leading chorister in the divine services. His office became herditary in his family, or he founded a school of poets and musicians, which were called, after him, "the sons of Asaph." *See* PSALMS.

**ASAPH, St.** A small cathedral city and bishop's see in Wales, 15 miles north-west of Flint; founded about 550 by St. Kentigern or St. Mungo, bishop of Glasgow, and named after his disciple St. Asaph, from whom both the diocese and town took their name. The cathedral was built about the close of the fifteenth century; it consists of a choir, a nave, two aisles, and a transept. Pop. (rural district, 1931), 7750.

**ASARABAC'CA.** A small hardy European plant, nat. ord. Aristolochiaceæ (*Asărum europœum*). Its leaves are acrid, bitter, and nauseous, and its root is extremely acrid. Both the leaves and root were formerly used as an emetic. It entered into the composition of medicated snuffs recommended in cases of headache.

**AS'ARUM.** *See* ASARABACCA.

**ASBEN, AIR,** or **AHIR.** A kingdom of Africa, in the Sahara. It consists of a succession of mountain groups and valleys, with a generally western slope, and attains in its highest summits a height of over 5000 feet. The valleys are very fertile, and often of picturesque appearance. The inhabitants are Tuaregs or Berbers, with an admixture of negro blood. They live partly in villages, partly as nomads. The country is nominally ruled over by a sultan, who resides in the capital, Agades. Pop. about 60,000.

**ASBES'TOS,** or **ASBESTUS.** A remarkable and highly-useful mineral, a fibrous variety of several members of the hornblende family, composed of separable filaments, with a silky lustre. The fibres are sometimes delicate, flexible, and elastic; at other times stiff and brittle. It is incombustible, and anciently was wrought into a soft, flexible cloth, which was used as a shroud for dead bodies.

In modern times it has been manufactured into incombustible cloth, gloves, felt, paper, etc.; is employed in gas-stoves; is much used as a covering to steam boilers and pipes; is mixed with metallic pigments, and used as a paint on wooden structures, roofs, partitions, etc., to render them fire-proof, and is employed in various other ways, the manufacture having recently greatly developed. Some varieties are compact, and take a fine polish, others are loose, like flax or silky wool. *Ligniform asbestos*, or *mountain-wood*, is a variety presenting an irregular filamentous structure, like wood. *Rock-cork*, *mountain-leather*, *fossil-paper*, and *fossil-flax* are varieties. Asbestos is found in many parts of the world, but is chiefly supplied by Italy, Canada, and Australia. Mineralogically it is distinct from chrysotile, which is used for similar purposes.

**ASBJÖRNSEN** (ăs'byeurn-sen), **Peter Kristen.** Born 1812, died 1885, a distinguished Norwegian naturalist and collector of the popular tales and legends, fairy stories, etc., of his native country.

**ASBURY PARK.** A small town on the coast of New Jersey, United States, a great summer resort. Its population increases during the summer months from 10,000 to 100,000.

**AS'CALON,** or **ASH'KELON.** A ruined town of Palestine, on the seacoast, 40 miles W.S.W. of Jerusalem. It was occupied by the Crusaders under Richard I. after a great battle with Saladin (1192) and by General Allenby's troops in Nov., 1917.

**ASCA'NIUS.** The son of Æneas and Creusa, and the companion of his father's wanderings from Troy to Italy.

**AS'CARIS.** *See* NEMATODA.

**ASCEN'SION** (discovered on Ascension Day). An island of volcanic origin belonging to Britain, near the middle of the South Atlantic Ocean, about lat. 7° 55′ S.; long. 14° 25′ W.; 700 miles north-west of St. Helena;

area, about 34 sq. miles. Pop. about 200. It was till 1922 a British naval sanatorium, coaling and victualling station, and store depot. It has a steam factory, naval and victualling yards, hospitals, and a coal depot. It is celebrated for its turtle, which are the finest in the world. Wild goats are plentiful, and oxen, sheep, pheasants, guinea-fowl, and rabbits have been introduced, and thrive well. The village of Georgetown stands on the west side of the island. Since 1922 Ascension has been under the Colonial Office, and is administered as part of St. Helena.

**ASCENSION, RIGHT.** Of a star or other heavenly body, in astronomy, the arc of the equator intercepted between the first point of Aries and that point of the equator which comes to the meridian at the same instant with the star.

**ASCENSION DAY.** The day on which the ascension of the Saviour is commemorated, often called *Holy Thursday* : a movable feast, always falling on the Thursday but one before Whitsuntide.

**ASCET'ICISM** and **ASCET'ICS** (from the Gr. *askēsis*, meaning practice, bodily exercise, or athletic training). The early Christians, who devoted themselves to severe exercises of piety and strove to distinguish themselves from the world by abstinence from sensual enjoyments and by voluntary penances, adopted the name to signify the practice of spiritual things.

Ascetics and asceticism have played an important part in the Christian Church, but the principle of striving after a higher and more spiritual life by subduing the animal appetites and passions has no necessary connection with Christianity. Thus there were ascetics among the Jews previous to Christ, and asceticism was inculcated by the Stoics, while in its most extreme form it may still be seen among the Brahmans and Buddhists. Monasticism was but one phase of asceticism.

It must also be borne in mind that in the history of asceticism, pagan, Christian, Jewish, and Mohammedan, we are often dealing not only with religious but distinctly abnormal temperaments. *See* MONASTICISM.

**ASCH** (ásh). A town of Czechoslovakia, in the extreme north-western corner of former Bohemia, with manufactures of cotton, woollen, and silk goods, bleachfields, dyeworks, etc. Pop. 21,583.

**ASCHAFFENBURG** (á-shâf'en-bŏrh). A town of Bavaria, on the Main and Aschaff, 26 miles E.S.E. of Frankfort. The chief edifice is the castle of Johannisberg, built between 1605 and 1614, and for centuries the summer residence of the Elector. There are manufactures of coloured paper, tobacco, liqueurs, etc. Pop. 32,000.

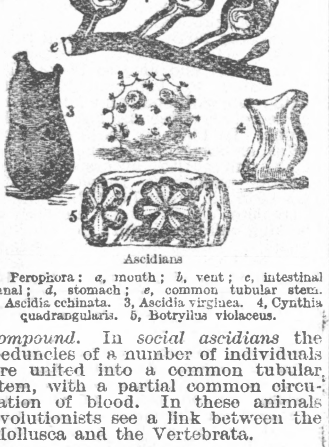
**ASCHAM** (as'kam), **Roger.** A learned Englishman, born in 1515 of a respectable family in Yorkshire, died 1568. He was entered at St. John's College, Cambridge, 1530, and was elected fellow in 1534 and tutor in 1537. He was Latin secretary to Edward VI. and also to Mary. He was tutor to Princess Elizabeth during her girlhood, and he became her secretary after she ascended the throne. In 1544 he wrote his *Toxophilus, or Schole of Shooting*, in praise of his favourite amusement and exercise—archery. Between 1563 and 1568 he wrote his *Scholemaster*, a treatise on the best method of teaching children Latin. Some of his writings, including many letters, were in Latin. He wrote the best English style of his time. His life was written by Dr. Johnson to accompany an edition of his works published in 1769.

**ASCHE, Oscar.** English actor. Born at Geelong, Australia, Aug. 26, 1872, he was educated at Melbourne. Having studed acting at Oslo, he appeared on the stage in 1893 and played under F. R. Benson and H. B. Tree. He also toured in the United States, Australia and South Africa. In 1904 he became manager of the Adelphi theatre, London, and in 1907 of His Majesty's and then of the Globe. He is best known as the producer of *Chu Chin Chow*, in which he played the title rôle. He married the actress Lily Brayton.

**ASCHERSLEBEN** (ásh'ĕrz-lā-ben). A town of Prussian Saxony, in the district of Magdeburg, near the junction of the Eine with the Wipper. Industries : woollens, machinery and metal goods, sugar, paper, etc. Pop. 28,968.

**ASCID'IA** (Gr. *askos*, a wine-skin). The name given to the " Sea-squirts " or main section of the Tunicata, a class of animals of low grade, resembling a double-necked bottle, of a leathery or gristly nature, found at low-water mark on the sea-beach, and dredged from deep water attached to stones, shells, and fixed objects. One of the prominent openings admits the food and the water required in respiration, the other is the excretory aperture. A single *ganglion* represents the nervous system, placed between the two apertures.

Male and female reproductive organs exist in each ascidian. They pass through peculiar phases of development, the young ascidian appearing like a tadpole-body. They may be *single* or *simple*, *social* or




Ascidians

1, Perophora: *a*, mouth; *b*, vent; *c*, intestinal canal; *d*, stomach; *e*, common tubular stem. 2, Ascidia echinata. 3, Ascidia virginea. 4, Cynthia quadrangularis. 5, Botryllus violaceus.

*compound*. In *social ascidians* the peduncles of a number of individuals are united into a common tubular stem, with a partial common circulation of blood. In these animals evolutionists see a link between the Mollusca and the Vertebrata.

**ASCLEPIADA'CEÆ.** An order of gamopetalous Dicotyledons, the distinguishing characteristic of which is that the anthers adhere to the five stigmatic processes, the whole sexual apparatus forming a single mass. The pollination arrangements are peculiar, recalling those of orchids. The members of this order are shrubs, or sometimes herbaceous plants, occasionally climbing, almost always with a milky juice. Many of them are employed as purgatives, diaphoretics, tonics, and febrifuges, and others as articles of food. Asclepias is the typical genus. *See* ASCLEPIAS, CALOTROPIS, STAPELIA, STEPHANOTIS.

**ASCLE'PIADES** (-dēz). The name of a number of ancient Greek writers—poets, grammarians, etc.—of whom little is known, and also of several ancient physicians, the most celebrated of whom was *Asclepiades*, of Bithynia, who acquired considerable repute at Rome about the beginning of the first century B.C.

**ASCLE'PIAS, or SWALLOW-WORT.** A genus of plants, the type and the largest genus of the nat. ord. Asclepiadaceæ. Most of the species are North American herbs, having opposite, alternate, or verticillate leaves. Many of them possess powerful medicinal qualities. *A. decumbens* is diaphoretic and sudorific, and has the singular property of exciting general perspiration without increasing in any sensible degree the heat of the body; *A. curassavica* is emetic, and its roots are frequently sent to England as ipecacuanha; the roots of *A. tuberōsa* are famed for diaphoretic properties. Many other species are also used as medicines, and several are cultivated for the beauty of their flowers.

**ASCLEPIOS.** *See* ÆSCULAPIUS.

**AS'COLI, or ASCOLI PICENO** (ancient, **ASCŬLUM**). A province in Central Italy.—The capital of the province, also called **Ascoli Piceno**, episcopal see of the Marches (the ancient Ascŭlum), is situated 90 miles north-east of Rome and contains, among several handsome new buildings, the remains of temples, an ancient theatre, etc. It has also many fine pre-Renaissance buildings, such as the Gothic Church S. Francesco and the Palazzo del Commune. At Castel Trosino, near Ascoli, a necropolis of the seventh century was discovered in 1895. Population of the town, 32,095; of the province, 266,031 (area, 805 sq. miles).

**AS'COLI SATRIANO** (ancient, **ASCŬLUM APŬLUM**). A town of S. Italy, province Foggia. Pop. 9700.

**ASCOMYCE'TES** (-tēz). One of the main subdivisions of the Eumycetes or Higher Fungi, distinguished by their principal spores being produced in organs called *asci*. Typically, an *ascus* is a cylindrical or club-shaped structure containing at maturity eight *ascospores*, which are usually liberated explosively and thereafter dispersed by the wind. As a rule numerous asci are massed together in a layer or *ascushymenium*, which is variously disposed on a more or less massive fruit-body, according to the form and structure of which the group is further subdivided into a number of sections and families, the chief being Erysiphales, Plectascineæ, Pyrenomycetes, Discomycetes (q.v.).

**ASCO'NIUS (Quintus A. Pedianus).** A Roman writer of the first century A.D., who wrote a life of Sallust, a reply to the detractors of Virgil, and commentaries on Cicero's orations, some of which are extant.

**AS'COT.** An English race-course adjacent to the S.W. extremity of the great park of Windsor. The races, which take place in the second week in June, constitute, for value of stakes and quality of horses, the

best meeting of the year, as it is the most fashionable.

**AS'GARD** (literally, gods' yard, or the abode of the gods). In Scandinavian mythology the home of the gods or *Æsir*, rising, like the Greek Olympus, from *midgard*, or the middle world, that is, the earth. It was here that Odin and the rest of the gods, the twelve Æsir, dwelt—the gods in the mansion called Gladsheim, the goddesses dwelling in Vingulf. Walhalla, in which heroes slain in battle dwelt, was also here. Below the boughs of the ash tree Yggdrasill the gods assembled every day in council.

**ASGILL** (as'gil). **John.** An eccentric English writer, a lawyer by profession, born 1659, died 1738. In 1699 he published a pamphlet to prove that Christians were not necessarily liable to death, death being the penalty imposed for Adam's sin and Christ having satisfied the law. Having crossed over to Ireland, he was beginning to get into a good practice, and was elected to the Irish House of Commons, when his pamphlet was ordered to be burned by the public hangman, and he himself was expelled the House. His whole subsequent life was passed in pecuniary and other troubles, mostly in the Fleet or within the rules of the King's Bench.

**ASH** (*Fraxinus*). A genus of deciduous trees belonging to the nat. ord. Oleaceæ, having imperfect flowers and a seed-vessel prolonged into a thin wing at the apex (called a *samara*). There are a good many species, chiefly indigenous to North America. The common ash (*F. excelsior*), the only species indigenous to Central and Northern Europe, has a smooth bark, and grows tall and rather slender. The branches are flattened; the leaves have five pairs of pinnæ, terminated by an odd one, dark-green in colour; lanceolate, with serrated edges. The flowers are produced in loose spikes from the sides of the branches, and are succeeded by flat seeds which ripen in autumn. It is one of the most useful of British trees on account of the excellence of its hard tough wood and the rapidity of its growth, but often suffers greatly from a canker caused by the fungus *Nectria ditissima*.

There are many varieties of it, as the weeping-ash, the curled-leaved ash, the entire-leaved ash, etc. The flowering or manna ash (*F. Ornus*), by some placed in a distinct genus (Ornus), is a native of the south of Europe and Palestine. It yields the substance called manna, which is obtained by making incisions in the bark, when the juice exudes and hardens. Among American species are the white ash (*F. americana*),

Common Ash (*Fraxinus excelsior*).

1, Hermaphrodite flower. 2, Anthers of male flower.

with lighter bark and leaves; the red or black ash (*F. pubescens*), with a brown bark; the black ash (*F. sambucifolia*), the blue ash, the green ash, etc. They are all valuable trees. The mountain-ash or rowan belongs to a different order.

**ASH, or ASHES.** The incombustible residue of organic bodies (animal or vegetable) remaining after combustion; in common usage, any incombustible residue of bodies used as fuel; as a commercial term, the word generally means the ashes of vegetable substances, from which are extracted the alkaline matters called potash, pearl-ash, kelp, barilla, etc.

**ASHAN'GO.** A region in the interior of Southern Africa between lat. 1° and 2° S., and between the Ogowe and the Lower Congo, a mountainous country in the French territory. The inhabitants belong to the Bantu stock, and among them are a dwarfish people, the Obongo, said to be about 4½ feet high at most.

**ASHANTI'.** A British protectorate in West Africa belonging to the Gold Coast Colony, of which it forms a large inland portion, under a chief commissioner; area about 20,000 sq. miles. It is in great part hilly, well-watered, and covered with dense tropical vegetation, and rich forests with excellent timber trees. The country round the towns, however, is carefully cultivated. The crops are chiefly rice, maize, millet, sugar-cane, cocoa, and yams, the last forming the staple vegetable food of the natives. Rubber is also a product. The domestic animals are cows, horses of small size, goats, and a species of hairy sheep. The wild animals include the elephant, rhinoceros, buffalo, lion, hippopotamus, etc. Birds are numerous, and crocodiles and other reptiles abound. Gold is abundant, and mining concessions are now successfully worked. The Ashantis make excellent cotton and silk cloths, articles in gold and other metals, earthenware, leather, etc.

Ashanti used to form a kingdom ruled despotically, human sacrifices being very common. It is now under British administration, and attention is given to education, sanitation, agriculture, means of communication, etc. There are Government schools at Coomassie and Sunyani and a number of missionary schools. The chief town is Kumasi (or Coomassie), now reached by a railway from the coast (length 168 miles); its population is 24,000.

The British first came in contact with the Ashantis in 1807, and hostilities continued off and on till 1826, when they were driven from the sea-coast. Immediately after the transfer of the Dutch settlements on the Gold Coast to Britain in 1872—when the entire coast remained in British hands—the Ashantis reclaimed the sovereignty of the tribes round the settlement of Elmina. This brought on a war, leading to a British expedition in 1874, in which Coomassie was captured. In 1896 the country became a British protectorate. In 1901 a rebellion had to be put down, and next year Ashanti was fully annexed. Pop. 407,000.—Cf. R. A. Freeman, *Travels and Life in Ashantee and Jaman.*

**ASH'BOURNE.** A town of England, in Derbyshire, 12 miles N.W. of Derby, with manufactures of cottons and lace. Pop. (1931), 4507.

**ASH'BURTON.** A town in Devonshire, England, 16 miles S.W. of Exeter, a parliamentary borough till 1868, and till 1918 giving name to a parliamentary division. Pop. (1931), 2505.

**ASH'BURTON, Alexander Baring, Lord.** A British statesman and financier, born 1774, died 1848. A younger son of Sir Francis Baring, he was bred to commercial pursuits, which for some years kept him in the United States and Canada, and in 1810 he became head of the great firm of Baring Brothers & Co. He sat in Parliament from 1806 to 1835, when he was raised to the peerage, after being a member of Peel's Government (1834-5).

The **Ashburton Shield** is a prize for shooting, founded in 1861 by the 3rd Lord Ashburton. It is shot for each year at Bisley by teams from the public schools.

**ASH'BURTON TREATY.** A treaty concluded at Washington, 1842, by Alexander Baring, Lord Ashburton, and the President of the United States; it defined the boundaries between the States and Canada, etc.

**ASHBY-DE-LA-ZOUCH** (ash'bi-del-a-zöch'). A town in Leicestershire, England, on the borders of Derbyshire, with manufactures of hosiery, leather, etc. Pop. (1931), 5093.

**ASH'DOD.** A place on the coast of Palestine, formerly one of the chief cities of the Philistines, now an insignificant village. It is mentioned in the New Testament.

**ASHDOWN.** Forest district in Sussex. It is a part of the old Andredsweald and stretches for almost 5 miles from Chelwood Gate to Crowborough. Its area is about 14,000 acres.

**ASHDOWN PARK.** In Berkshire, is the seat of the Earl of Craven. It is 3 miles from Lambourne and is believed to be the Assandune where, in 871, King Ethelred and his brother Alfred defeated the Danes. Near is the cave of Wayland the Smith.

**A'SHER.** One of Jacob's sons, and founder of the tribe called after him, who occupied a fertile territory in Palestine along the coast between Carmel and Lebanon.

**ASHE'RA.** An ancient Semitic goddess whose symbol was the phallus. In the Revised Version of the Old Testament this word is used to translate what in the Authorized

Version is translated "grove," as connected with the idolatrous practices into which the Jews were prone to fall.

**ASHES, THE.** Term which originated in 1882, when a burlesque obituary notice in the *Sporting Times* announced that the Ashes of English cricket were being taken to Australia. This referred to Australia's first victory over England, 29th August, 1882, by 7 runs, marking the first serious challenge to England's cricket supremacy.

**ASH'FORD.** A thriving town of England, in Kent, situated near the confluence of the upper branches of the River Stour, with large locomotive and railway-carriage works. It gives name to a parliamentary division of the county. Pop. (1931), 15,239.

**ASHINGTON.** An urban district or town of England, Northumberland, north-east of Morpeth, and about 2 miles from the sea, in a district of collieries. Pop. (1931), 29,418.

**ASHI'RA.** A native race or people of Western Equatorial Africa, to the south of the Ogowe River, in the French Congo Territory.

**ASH'LAND.** A city of the United States, in Wisconsin. Pop. (1920), 11,334.—Also a city of Kentucky. Pop. (1920), 14,729.

**ASH'LAR.** Masonry consisting of stones squared and smoothed in front and built in regular courses.

**ASHLEY, Lord.** *See* SHAFTESBURY, FIRST EARL OF.

**ASHMEAD-BARTLETT, Sir Ellis.** English politician, born in 1849. He entered Parliament in 1880, and was Civil Lord of the Admiralty from 1885 to 1892. He served in the Græco-Turkish and South African wars, and was knighted in 1892. He died in 1902.

**ASH'MOLE, Elias.** English antiquary, born 1617, died 1692. He became a chancery solicitor in London, but afterwards studied at Oxford, taking up mathematics, physics, chemistry, and particularly astrology. He published *Theatrum Chymicum* in 1652. On the Restoration he received the post of Windsor Herald, and other appointments both honourable and lucrative. In 1672 appeared his *History of the Order of the Garter*. He presented to the University of Oxford his collection of rarities, to which he afterwards added his books and MSS., thereby commencing the Ashmolean Museum.

**ASH'TAROTH.** *See* ASTARTE.

**ASHTON-IN-MAKERFIELD.** A town of Lancashire, England, 4 miles from Wigan, with collieries, cotton-mills, etc. Pop. (1931), 20,541.

**ASHTON-UNDER-LYNE.** A municipal and parliamentary borough of Lancashire, England, 6 miles east of Manchester, on the north bank of the River Tame, a well-built place, with handsome streets and public buildings. The chief employment is the cotton manufacture, but there are also collieries and ironworks, which employ a great many persons. The population in 1931 was 51,573.

**ASHTON-UPON-MERSEY.** A former urban district of England, Cheshire, on the south side of the Mersey, several miles south-west of Manchester. It is now in Sale urban district.

**ASHURA'DA.** A small island in the S.E. corner of the Caspian, formed by Russia into a trading station.

**ASH-WEDNESDAY.** The first day of Lent, so called from a custom in the Western Church of sprinkling ashes that day on the heads of penitents, then admitted to penance. The period at which the fast of Ash-Wednesday was instituted is uncertain; but it probably dates from the eighth century at least. In the Roman Catholic Church the ashes are now strewn on the heads of all the clery and people present. In the Anglican Church Ash-Wednesday is regarded as an important fast day.

**ASIA.** The largest of the great divisions of the earth; length, from the extreme south-western point of Arabia, at the Strait of Bab-el-Mandeb, to the extreme north-eastern point of Siberia—East Cape, or Cape Vostochni, in Behring's Strait—6900 miles; breadth, from Cape Chelyuskin, in Northern Siberia, to Cape Romania, the southern extremity of the Malay Peninusla, 5300 miles; area estimated at 17,250,000 sq. miles, about a third of all the land of the earth's surface.

**Boundaries.** On three sides, N., E., and S., the ocean forms its natural boundary, while in the W. the frontier is marked mainly by the Ural Mountains, the Ural River, Caspian Sea, the Caucasus, the Black Sea, the Mediterranean, the Suez Canal, and the Red Sea. There is no proper separation between Asia and Europe, the latter being really a great penisula of the former. Asia, though not so irregular in shape as Europe, is broken in the S. by three great peninsulas, Arabia, India, and Malay, while the east coast presents peninsular projections and islands, forming a series of sheltered seas and

bays, the principal peninsulas being Kamchatka and Korea.

**Islands.** The principal islands are those forming the Malay or Asiatic Archipelago, which stretch round in a wide curve on the S.E. of the continent. Besides the larger islands —Sumatra, Java, Borneo, Celebes, Mindanao, and Luzon (in the Philippine group)—there are countless smaller islands grouped round these. Other islands are Ceylon, in the S. of India; the Japanese Islands and Sakhalin, on the E. of the continent; Formosa, S.E. of China; Cyprus, S. of Asia Minor; and New Siberia and Wrangell, in the Arctic Ocean.

**Mountains.** The mountain systems of Asia are of great extent, and their culminating points are the highest in the world. The greatest of all is the Himálaya system, which lies mainly between long. 70° and 100° E. and lat. 28° and 37° N. It extends, roughly speaking, from north-west to south-east, its total length being about 1500 miles, forming the northern barrier of India. The loftiest summits are Mount Everest, 29,002 feet high, Godwin-Austen, 28,265, and Kangchenjunga, 28,156. The principal passes, which rise to the height of 18,000 to 20,000 feet, are the highest in the world.

A second great mountain system of Central Asia, connected with the north-western extremity of the Himálaya system by the elevated region of Pamir (about long. 70°-75° E., lat. 37°-40° N.), is the Tien Shan system, which runs north-eastward for a distance of 1200 miles. In this direction the Altai, Sayan, and other ranges continue the line of elevations to the north-eastern coast. A north-western continuation of the Himálaya is the Hindu Kush, and farther westward a connection may be traced between the Himálaya mass and the Elburz range (18,460) feet, south of the Caspian, and thence to the mountains of Kurdistan, Armenia, and Asia Minor.

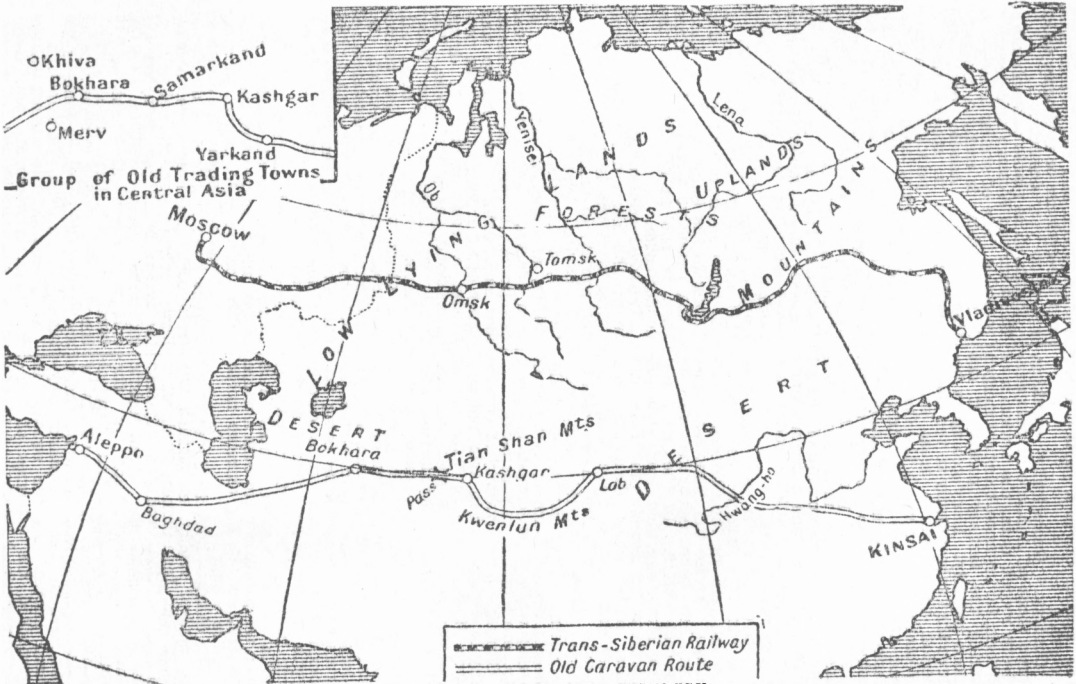
**Plateaux.** There are vast plateaux and elevated valley regions connected with the great central mountain systems, but large portions of the continent are low and flat. Tibet forms the most elevated table-land in Asia, its mean height being estimated at 15,000 feet. On its south is the Himálayan range, while the Kunlun range forms its northern barrier. Another great but much lower plateau is that which comprises Afghanistan, Baluchistan, and Persia, and which to the north-west joins into the plateau of Asia Minor. The principal plain of Asia is that of Siberia, which extends along the north of the continent and forms an immense alluvial tract sloping to the Arctic Ocean. Vast swamps or peat-mosses called *tundras* cover large portions of this region. South-west of Siberia, and stretching eastward from the Caspian, is a low-lying tract consisting to a great extent of steppes and deserts, and including in its area the Sea of Aral.

In the east of China there is an alluvial plain of some 200,000 sq. miles in extent; in India are plains extending for 2000 miles along the south slope of the Himálaya; and between Arabia and Persia, watered by the Tigris and Euphrates, is the plain of Mesopotamia or Assyria, one of the richest in the world. Of the deserts of Asia the largest is that of Gobi (long. 90°-120° E., lat. 40°-48° N.), large portions of which are covered with nothing but sand or display a surface of bare rock. An almost continuous desert region may also be traced from the desert of North Africa through Arabia (which is largely occupied by bare deserts), Persia, and Baluchistan to the Indus.

**Rivers.** Some of the largest rivers of Asia flow northward to the Arctic Ocean—the Ob', the Yenisei, and the Lena. The Hwang-Ho, Yangtze Kiang, and Amur are the chief of those which flow into the Pacific. The Ganges, Bramaputra, Irawaddy, and Indus flow into the Indian Ocean. The Persian Gulf receives the united waters of the Euphrates and the Tigris. There are several systems of inland drainage, large rivers falling into lakes which have no outlet.

**Lakes.** The largest lake of Asia (partly also European) is the Caspian Sea, which receives the Kur from the Caucasus (with its tributary the Aras from Armenia), and the Sefid Rud and other streams from Persia (besides the Volga from European Russia, and the Ural, which is partly European, partly Asiatic). The Caspian lies in the centre of a great depression, being 83 feet below the level of the Sea of Azov. East from the Caspian is the Sea of Aral, which, like the Caspian, has no outlet, and is fed by the Rivers Amu Darya (Oxus) and Sir Darya.

Still farther east, to the north of the Tien Shan Mountains, and fed by the Ili and other streams, is Lake Balkhash, also without an outlet and very salt. Other lakes having no communication with the ocean are Lop Nor, in the desert of Gobi, receiving the River Tarim, and the Dead Sea, far below the level of the Mediterranean, and fed by the Jordan. The chief fresh-water lake is Lake Baikal, in the south of Siberia, between long. 104° and




CENTRAL ASIA AND TRANS-SIBERIAN RLY.

110° E., a mountain lake from which the Yenisei draws a portion of its waters.

**Geology.** Geologically speaking, large areas of Asia are of comparatively recent date, the lowlands of Siberia, for instance, being submerged during the tertiary period, if not more recently. Many geologists believe that subsequently to the glacial period there was a great sea in Western Asia, of which the Caspian and Aral Seas are the remains. The desiccation of Central Asia is still going on, as is also probably the upheaval of a great part of the continent. The great mountain chains and elevated plateaux are of ancient origin, however, and in them granite and other crystalline rocks are largely represented.

Active volcanoes are only met with in the extreme east (Kamchatka) and in the Eastern Archipelago. From the remotest times Asia has been celebrated for its mineral wealth. In the Altai and Ural Mountains gold, iron, lead and platinum are found; in India and other parts rubies, diamonds, and other gems are, or have been, procured; salt in Central Asia; coal in China, India, Central Asia, etc.; petroleum in the districts about the Caspian and in Burma; bitumen in Syria; while silver, copper, sulphrur, etc., are found in various parts.

**Climate.** Every variety of climate may be experienced in Asia, but as a whole it is marked by extremes of heat and cold and by great dryness, this in particular being the ease with vast regions in the centre of the continent and distant from the sea. The great lowland region of Siberia has a short but very hot summer, and a long but intensely cold winter, the rivers and their estuaries being fast bound with ice, and at a certain depth the soil is hard frozen all the year round. The northern part of China to the east of Central Asia has a temperate climate with a warm summer, and in the extreme north a severe winter.

The districts lying to the south of the central region, comprising the Indian and Indo-Chinese Peninsulas, Southern China, and the adjacent islands, present the characteristic climate and vegetation of the southern temperate and tropical regions modified by the effects of altitude. Some localities in Southern Asia have the heaviest rainfall anywhere known. As the equator is approached the extremes of temperature diminish till at the southern extremity of the continent they are such as may be experienced in any tropical country. Among climatic features are the monsoons of the Indian Ocean and the eastern seas, and the cyclones or typhoons, which are often very destructive.

**Plants.** The plants and animals of Northern and Western Asia generally resemble those of similar latitudes in Europe (which is really a prolongation of the Asiatic continent), differing more in species than in genera. The principal mountain trees are the pine, larch, and birch; the willow, alder, and poplar are found in lower grounds. In the central region European species reach as far as the Western and Central Himálaya, but are rare in the Eastern. They are here met by Chinese and Japanese forms. The lower slopes of the Himálaya are clothed almost exclusively with tropical forms. Higher up, between 4000 and 10,000 feet, are found all the types of trees and plants that belong to the temperate zone, there being extensive forests of conifers. Here is the native home of the deodar cedar.

The south-eastern region, including India, the Eastern Peninsula, and China, with the islands, contains a vast variety of plants useful to man and having here their original habitat, such as the sugar-cane, rice, cotton, and indigo, pepper, cinnamon, cassia, clove, nutmeg, and cardamoms, banana, coconut, areca, and sago palms; the mango and many other fruits, with plants producing a vast number of drugs, caoutchouc, and gutta-percha. The forests of India and the Malay Peninsula contain oak, teak, sâl, and other timber woods, besides bamboos, palms, sandal-wood, etc. The palmyra palm is characteristic of Southern India; while the talipot palm flourishes on the western coast of India, Ceylon, and the Malay Peninsula.

The cultivated plants of India and China include wheat, barley, rice, maize, millet, sugar-cane, tea, coffee, indigo, cotton, jute, opium, tobacco, etc. In North China and the Japanese Islands large numbers of deciduous trees occur, such as oaks, maples, limes, walnuts, poplars, and willows, the genera being European but the individual species Asiatic. Among cultivated plants are wheat, and in favourable situations rice, cotton, the vine, etc. Coffee, rice, sugar, etc., are extensively grown in some of the islands of the Asiatic Archipelago.

In Arabia and the warmer valleys of Persia, Afghanistan, and Baluchistan aromatic shrubs are abundant. Over large parts of these regions the date palm flourishes and affords a valuable article of food. Gum-

producing acacias are, with the date palm, the commonest trees in Arabia. African forms are found extending from the Sahara along the desert region of Asia.

**Animals.** Nearly all the mammals of Europe are found in Northern Asia, with numerous additions to the species. Central Asia is the native land of the horse, the ass, the ox, the sheep, and the goat. Both varieties of the camel, the single and the double humped, are Asiatic. To the inhabitants of Tibet and the higher plateaux of the Himálaya the yak is what the reindeer is to the tribes of the Siberian plain, almost their sole wealth and support. The elephant, of a different species from that of Africa, is a native of tropical Asia. The Asiatic lion, which inhabits Arabia and Persia, and still exists in the north-west of India, is smaller than the African species. Bears are found in all parts, the white bear in the far north, and other species in the more temperate and tropical parts.

The tiger is the most characteristic of the larger Asiatic Carnivora. It is found in Armenia and throughout the entire continent, being absent, however, from the greater portion of Siberia and from the high tableland of Tibet; it is found also in Sumatra, Java, and Bali. In South-Eastern Asia and the islands we find the rhinoceros, buffalo, ox, deer, squirrels porcupines, etc. In birds nearly every order is represented. Among the most interesting forms are the hornbills, the peacock, the Impey pheasant, the tragopan or horned pheasant, and other gallinaceous birds, the pheasant family being very characteristic of South-Eastern Asia. It was from Asia that the common domestic fowl was introduced into Europe.

The tropical parts of Asia abound in monkeys, of which the species are numerous. Some are tailed, others, such as the orang, are tailless, but none have prehensile tails like the American monkeys. In the Malay Archipelago marsupial animals, so characteristic of Australia, first occur in the Moluccas and Celebes, while various mammals common in the western part of the Archipelago are absent. A similar transition towards the Australian type takes place in the species of birds. (*See* WALLACE'S LINE).

Of marine mammals the dugong is peculiar to the Indian Ocean; in the Ganges is found a peculiar species of dolphin. At the head of the reptiles stands the Gangetic crocodile, frequenting the Ganges and other large rivers. Among the serpents are the cobra de capello, one of the most deadly snakes in existence; there are also large boas and pythons, besides sea and fresh-water snakes. The seas and rivers produce a great variety of fish. The Salmonidæ are found in the rivers flowing into the Arctic Ocean. Two rather remarkable fishes are the climbing perch and the archer-fish. The well-known goldfish is a native of China.

**Population.** The population of Asia is estimated at 823,000,000, and belongs to two great ethnographic types, the Caucasic or fair, and the Mongolian or yellow. To the former belong the Aryan and the Semitic races, while the latter comprises the Malays and the Indo-Chinese. To these two divisions may be added the Dravidians of Southern India, the Cingalese of Ceylon, the Ainos of Yezo, and the Negrito tribes of the Eastern Archipelago. The chief independent states are China, Japan,' Afghanistan, Persia, Iraq, Arabia, Siam, Nepal, and Bhutan, together with the Socialist Soviet Republics in Transcaucasia and Siberia.

British territories in Asia are India, Malaya, Borneo, Aden, Hong Kong, Cyprus, certain islands and the mandated territories of Palestine and Transjordan. To the United States belong the Philippine Islands; France has certain holdings in India, French Indo-China, and the mandated territories of Syria and Lebanon; Russia has Siberia; Korea, Formosa, and various minor places are Japanese; most of the Malay Archipelago belongs to Holland; Italy possesses Tientsin; and Portugal has Macao, Goa, Damão, Diu, and part of Timor. Asia is naturally a land of many religions. Brahmanism is found in India; Buddhism in China, Burma, and Japan; Confucianism in China; Shintoism in Japan; and Mahommedianism in Arabia, Persia, and India. Several native Christian sects are found in Aremnia, Syria, India, and Kurdistan.

**History.** Asia is generally regarded as the cradle of the human race. It possesses the oldest historical documents, and, next to the immediately contiguous kingdom of Egypt, the oldest historical monuments in the world. The Old Testament contains the oldest historical records which we have of any nation in the form of distinct narrative. The period at which Moses wrote was probably 1500 or 1600 years before the Christian era. His and the later Jewish writings confine themselves almost exclusively to the history of the Hebrews; but in Babylonia, as

in Egypt, civilization had made great advances long before this time.

The earliest seat of the Aryan race some assign to the banks of the Oxus. Hence, perhaps from the pressure of the Mongolian tribes to the north, they spread themselves to the south-east and south-west, finally occupying Northern India, Persia, and other parts of Western Asia, and spreading into Europe, perhaps about 2000-1500 B.C. In China authentic history extends back probably to about 1000 B.C., with a long preceding period of which the names of dynasties are preserved without chronological arrangement. The kingdoms of Assyria, Babylonia, Media, and Persia predominated by turns in South-Western Asia. In regard to the history of these monarchies, much light has been obtained from the decipherment of the cuneiform inscriptions. The arms of the Pharaohs extended into Asia, but their conquests there were short-lived. From Cyrus (559 B.C.), who extended the empire of Persia from the Indus to the Mediterranean, while his son, Cambyses, added Egypt and Libya to it, to the conquest of Alexander (330 B.C.) Persia was the dominant Power in Western Asia.

Alexander's great empire became broken up into separate kingdoms, which were finally absorbed in the Roman Empire, and this ultimately extended to the Tigris. Soon after the most civilized portions of the three continents had been reduced under one empire, the great event took place which forms the dividing-line of history, the birth of Christ and the spread of Christianity. In A.D. 226 a protracted struggle began between the newer Persian Empire and the Romans, which lasted till the advent of Mahomet, and the conquests of the Arabians. Persia was the first great conquest of Mahomet's followers. Syria and Egypt soon fell before their arms, and within forty years of the celebrated flight of Mahomet from Mecca (the *Hejra*), the sixth of the caliphs, or successors of the Prophet, was the most powerful sovereign of Asia.

The Mongols next became the dominant race. In 999 Mahmud, whose father, born a Turkish slave, became Governor of Ghazni, conquered India, and established his rule. The dynasty of the Seljuk Tartars was established in Aleppo, Damascus, Iconium, and Kharism, and was distinguished for its struggles with the Crusaders. Othman, an emir of the Seljuk sultan of Iconium, established the Ottoman Empire in 1300. About 1220 Genghis Khan, an independent Mongol chief, made himself master of Central Asia, conquered Northern China, overran Turkistan, Afghanistan, and Persia; his successors took Bagdad and abolished the caliphate. In Asia Minor they overthrew the Seljuk dynasty. One of them, Timur or Tamerlane, carried fire and sword over Northern India and Western Asia, defeated and took prisoner Bajazet, the descendant of Othman (1402), and received tribute from the Greek emperor.

The Ottoman Empire soon recovered from the blow inflicted by Timur, and Constantinople was taken and the Eastern Empire finally overthrown by the Sultan Mohammed II. in 1453. China recovered its independence about 1368 and was again subjected by the Manchu Tartars (1618-45), soon after which it began to extend its empire over Central Asia. Siberia was conquered by the Cossacks on behalf of Russia (1580-4). The same country effected a settlement in the Caucasus about 1786, and has since continued to make steady advances into Central Asia.

The discovery by the Portuguese of the passage to India by the Cape of Good Hope led to their establishment on the coast of the peninsula (1498). They were speedily followed by the Spanish, Dutch, French, and British. The struggle between the two last Powers for the supremacy of India was completed by the destruction of the French settlements (1760-5). At present the forms of government in Asia range from the primitive rule of the nomad sheik to the constitutional monarchy of Japan.—BIBLIOGRAPHY: Sven Hedin, *Through Asia*; H. F. Blanford, *Elementary Geography of India, Burma, and Ceylon*; Max. Müller, *The Sacred Books of the East*; A. Little, *The Far East*; R. Cobbold, *Innermost Asia*; Colonel A. Durand, *The Making of a Frontier*; J. G. C. Chamberlain, *Continents and their Peoples*; E. Huntington, *The Pulse of Asia*; E. C. Hannah, *Eastern Asia*.

**ASIA, CENTRAL.** A designation loosely given to the regions in the centre of Asia east of the Caspian, also called Turkistan, and formerly Tartary. The eastern portion belongs to China, the western to Russia. Russian Central Asia comprises the Kirghiz Steppe (Uralsk, Turgai, Akmolinsk, Semipalatinsk, etc.), and what was the government-general of Turkistan till 1918, besides the territory of the Turkomans or Transcaspia and Merv.

**ASIA MINOR.** The most westerly

portion of Asia, being the peninsula lying west of the Upper Euphrates, and forming part of Asiatic Turkey. It forms an extensive plateau, with lofty mountains rising above it, the most extensive ranges being the Taurus and Anti-Taurus, which border it on the south and south-east, and rise to over 10,000 feet. There are numerous salt and fresh-water lakes.

**Rivers.** The chief rivers are the Kizil-Irmak (Halys), Sakaria (Sangarius), entering the Black Sea; and the Sarabat (Hermus) and Menderes (Mæander), entering the Ægean. The coast regions are generally fertile, and have a genial climate; the interior is largely arid and dreary. Valuable forests and fruit-trees abound. Smyrna is the chief town. *Anatolia* is an equivalent name. *See* EUROPEAN WAR; TURKEY.

**ASIAGO.** A town in Italy in the province of Vicenza, capital of the Seven Communes (Sette Communi). In the great European War several battles were fought on the Asiago Plateau. The town was evacuated by the Italians on 28th May, 1916, but retaken on 25th June, 1916. *See* EUROPEAN WAR.

**ASIATIC SOCIETIES.** Learned bodies instituted for the purpose of collecting information respecting the different countries of Asia, such as the Asiatic Society of Bengal, founded in 1784 by Sir William Jones; and the Royal Asiatic Society of Great Britain and Ireland, established by Colebrooke, and opened in 1823. There are similar societies on the European Continent and in America, such as the Société Asiatique at Paris, founded in 1822; the Oriental Society of Germany (Deutsche Morgenländische Gesellschaft, founded in 1845; and the Oriental Scoiety at Boston, founded in 1842.

**ASIPHONA'TA, or ASIPHON'IDA.** An order of lamellibranchiate, bivalve molluscs, destitute of the siphon or tube through which, in the Siphonata, the water that enters the gills is passed outwards. It includes the oysters, the scallop-shells, the pearl-oyster, the mussels, and in general the most useful and valuable molluscs.

**ASIR.** *See* HEJAZ.

**ASKABAD'.** The administrative centre of the Russian province of Transcaspia, situated in the Akhal Tekke oasis, and occupied by Skobelev in Jan., 1881, after the sack of Geok Tepé. Its distance from Merv is 232 miles, from Herat 388 miles. Pop. 54,000.

**ASKARI.** African soldier. Derived from an Arabic word meaning "army," it is used for native soldiers who are trained and led by European officers.

**AS'KEW, Anne.** A victim of religious persecution, born 1521, martyred 1546. She was a daughter of Sir William Askew of Lincolnshire, and was married to a wealthy neighbour named Kyme, who, irritated by her Protestantism, drove her from his house. In London, whither she went probably to procure a divorce, she spoke against the dogmas of the old faith, and, being tried, was condemned to death as a heretic. Being put to the rack to extort a confession concerning those with whom she corresponded, she continued firm, and was then taken to Smithfield, chained to a stake, and burned.

**ASKJA** (ásk'yá). A volcano near the centre of Iceland, first brought into notice by an eruption in 1875. Its crater is 17 miles in circumference, surrounded by a mountain-ring from 500 to 1000 feet high, the height of the mountain itself being between 4000 and 5000 feet.

**ASKWITH, Baron.** English publicist. Born Feb. 17, 1861, George Ranken Askwith was educated at Marlborough and Brasenose College, Oxford. He became a barrister and practised successfully until 1907 when he was appointed an assistant secretary to the Board of Trade. He was soon in charge of the department that dealt with labour disputes, and from 1911 until his retirement in 1919 he was Chief Industrial Commissioner. In 1911 he was knighted, and in 1919 made a peer. Lord Askwith has written much on the subject of trade disputes, of which he has an unrivalled experience.

**AS'MANNSHAUSEN** (-hou-zn). A Prussian village on the Rhine, in the district of Wiesbaden, celebrated for its wine. Many judges prefer the red wine of Asmannshausen to the best Burgundy, but it retains its merits for three or four years only.

**ASMO'DAI, or ASMO'DEUS.** An evil spirit, who, as related in the book of Tobit, slew seven husbands of Sara, daughter of Raguel, but was driven away into the uttermost parts of Egypt by the young Tobias under the direction of the angel Raphael. Asmodai signifies a desolater, a destroying angel, identical with the demon Aeshma of the Zend-Avesta. He is represented in the Talmud as the prince of demons who drove King Solomon from his kingdom.

**ASMONÆ'ANS.** A family of high

priests and princes who ruled over the Jews for about 130 years, from 153 B.C., when Jonathan, son of Mattathias, the great-grandson of Chasmon or Asmonæus, was nominated to the high-priesthood.

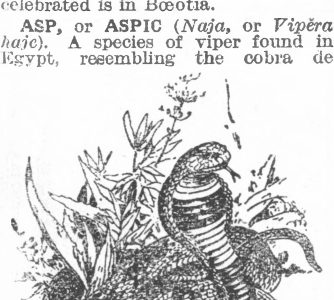
**ASNIÈRES** (ân-yār). A town on the Seine, a N.W. suburb of Paris, a favourite boating resort of the Parisians. Pop. 42,583.

**ASO'KA.** An Indian sovereign who reigned from 264 to 228 B.C. over the whole of Northern India, grandson of Chandragupta or Sandracottus. He embraced Buddhism, and forced his subjects also to become converts. Many temples and *stupas*, or brick cupolas, still remaining are attributed to him.

**ASO'KA** (*Jonesia asŏca*). An Indian tree, nat. ord. Leguminosæ, having a lovely flower, showing orange, scarlet, and bright-yellow tints; sacred to the god Siva, and often mentioned in Indian literature.

**ASO'PUS.** The name of several rivers in Greece, of which the most celebrated is in Bœotia.

**ASP,** or **ASPIC** (*Naja*, or *Vipĕra haje*). A species of viper found in Egypt, resembling the cobra de



Asp (*Naja haje*)

capello or spectacle-serpent of the East Indies, and having a very venomous bite. When approached or disturbed it elevates its head and body, swells out its neck, and appears to stand erect to attack the aggressor. Hence the ancient Egyptians believed that the asps were guardians of the spots they inhabited, and the figure of this reptile was adopted as an emblem of the protecting genius of the world.

The balancing motions made by it in the endeavour to maintain the erect attitude have led to the employment of the asp as a dancing serpent by the African jugglers. The "deaf adder that stoppeth her ear" of Psalm lviii. 4, 5, is translated asp in the margin, and seems to have been this species. Cleopatra is said to have committed suicide by means of an asp's bite, but the incident is generally associated with the Cerastes or horned viper, not with the haje. The name asp is also given to a viper (*Vipera aspis*) common on the continent of Europe.

**ASPARAGINE,** or **AMINOSUCCINAMIC ACID,** $C_2H_3{\cdot}NH_2(CO_2H)(CO{\cdot}NH_2)$. Is a white crystalline substance of unpleasant acid taste found in the shoots of asparagus, in potato and dahlia tribes, and in many other plants, from which it may be extracted by means of water.

**ASPAR'AGUS** (*Asparăgus officinālis*). A plant of the order Liliaceæ, the young shoots of which, cut as they are emering from the ground, are a favourite culinary vegetable. In Greece, and especially in the southern steppes of Russia and Poland, it is found in profusion; and its edible qualities were esteemed by the ancients. Pliny states that asparagus was in his time cultivated in gardens, particularly at Ravenna. The best asparagus is grown in gardens near the sea, and hundreds of acres are devoted to its cultivation in Holland and Belgium.

It grows wild in Essex and Lincolnshire, but does not attain nearly to the size of the cultivated plant. It is usually raised from seed; and the plants should remain three years in the ground before they are cut; after which, for several years, they will continue to afford a regular annual supply. The beds are protected by straw or litter in winter. Its diuretic properties are ascribed to the presence of a crystalline substance found also in the potato, lettuce, etc.

**ASPA'SIA.** A celebrated woman of ancient Greece, was born at Miletus, in Ionia, but passed a great part of her life at Athens, where her house was the general resort of the most distinguished men in Greece. She won the affection of Pericles, who united himself to Aspasia as closely as was permitted by the Athenian law, which declared marriage with a foreign woman illegal. Her power in the State has often been exaggerated, but it is beyond question that her genius left its mark upon the administration of Pericles. In 432-431 B.C. she was accused of

impiety, and was only saved from condemnation by the eloquence and tears of Pericles.

After his death (429 B.C.) Aspasia is said to have attached herself to a wealthy but obscure cattle-dealer of the name of Lysicles, whom she raised to a position of influence in Athens. Nothing more is known of her life. She had a son by Pericles, who was legitimated (430 B.C.) by a special decree of the people. There is a bust bearing her name in the Pio Clementino Museum in the Vatican.

**ASPATRIA.** A town (urban district) of England, Cumberland, 8 miles north-east of Maryport, with an agricultural college. Pop. (1931), 3239.

**AS'PE.** A town of Southern Spain, province of Alicante. Pop. (1921), 3525.

**AS'PECT.** In astrology, denotes the situation of the planets with respect to each other. There are five different major aspects: the sextile, when the planets are 60° distant; quartile, when they are 90° distant; trine, when 120° distant; opposition, when 180° distant; and conjunction, when both are in the same longitude. The aspects were classed by astrologers as *benign*, *malignant*, or *indifferent*, according to their fancied influences upon human affairs.

**ASPECT OF LAND.** *See* EXPOSURE.

**AS'PEN,** or **TREMBLING POPLAR** (*Pŏpŭlus tremŭla*). A species of poplar indigenous to Britain and to most mountainous regions throughout Europe and Asia. It is a beautiful tree of rapid growth and extremely hardy, with nearly circular toothed leaves, smooth on both sides, and attached to footstalks so long and slender as to be shaken by the slightest wind; wood light, porous, soft, and of a white colour, useful for various purposes.

**ASPER,** or **ASPRE.** A small Turkish coin, of which there are 120 in the piastre, value $\frac{1}{24}d$.

**ASPERGILL'US.** The brush used in Roman Catholic churches for sprinkling holy water on the people. It is said to have been originally made of hyssop.

**AS'PERN** and **ESSLINGEN** (or **ESSLING**) (es'ling-en). Two villages east of Vienna, and on the opposite bank of the Danube; celebrated as the chief contested positions in the bloody but indecisive battle fought between the Archduke Charles and Napoleon I., 21st and 22nd May, 1809, when it was estimated that the Austrians lost a third of their army, and the French no less than half.

**ASPER'ULA.** The woodruff genus of plants.

**ASPHALT,** or **ASPHAL'TUM.** The most common variety of bitumen; also called mineral pitch. Asphalt is a compact, glossy, brittle, black or brown mineral, which breaks with a polished fracture, melts easily with a strong pitchy odour when heated, and when pure burns without leaving any ashes. It is found in the earth in many parts of Asia, Europe, and America, and in a soft or liquid state on the surface of the Dead Sea, which, from this circumstance, was called *Asphaltites*.

It is of organic origin, the asphalt of the great Pitch Lake of Trinidad being derived from bituminous shales, containing vegetable remains in the process of transformation. Asphalt is produced artifically in making coal-gas. During the process much tarry matter is evolved and collected in retorts. If this be distilled, naphtha and other volatile matters escape, and asphalt is left behind. It is sometimes called *Jew's Pitch*.

**ASPHALTE** (or **ASPHALT**) **ROCK.** A limestone impregnated with bitumen, found in large quantities in various localities in Europe, as in the Val de Travers, Neufchâtel, Switzerland; in the department of Ain in France; in Alsace, Hanover, Holstein, Sicily, etc. These rocks contain a variable quantity of bitumen (from 7 or 8 to 20 or 30 per cent) naturally diffused through them. The Val de Travers asphalt was discovered in 1710.

In 1837 an English patent was taken out for its application to roads, pavements, terraces, areas, roofs, etc. Since then other asphalte-rocks, as well as artificial preparations made by mixing bitumen, gas-tar, pitch, or other materials with sand, chalk, etc., have been brought into competition with it.

**AS'PHODEL** (*Asphodēlus*). A genus of plants, ord. Liliaceæ, consisting of perennials, with fasciculated fleshy roots, flowers arranged in racemes, six stamens inserted at the base of the perianth, a sessile almost spherical ovary with two cells, each containing two ovules; fruit a capsule with three cells, in each of which there are, as a rule, two seeds. Two species are cultivated in Britain as garden flowers, the yellow asphodel (*Asphodelus lutĕus*) and the white asphodel (*Asphodelus albus*). The English word "daffodil" is a perversion of asphodel.

The *Asphodelus ramōsus*, which attains a height of 5 feet, is cultivated in Algeria and elsewhere, its tubercles yielding a very pure alcohol, and the residue, together with the stalks and leaves, being used in making pasteboard and paper. The asphodel was a favourite plant among the ancients, who were in the habit of planting it round their tombs. In Greek religion it is associated with Persephone, the dead, and the underworld.

**ASPHYX'IA.** Literally, the state of a living animal in which no pulsation can be perceived, but the term is more particularly applied to a suspension of the vital functions from causes hindering respiration. The normal accompaniments of death from asphyxia are dark fluid blood, a congested brain and exceedingly congested lungs, the general engorgement of the viscera, and an absence of blood from the left cavities of the heart while the right cavities and pulmonary artery are gorged.

**Treatment.** The restoration of asphyxiated persons has been successfully accomplished at long periods after apparent death. The attempt should be made to maintain the heat of the body and to secure the inflation of the lungs as in the case of the apparently drowned. *See* RESPIRATION.

**ASPHYXIATING GAS.** *See* POISON GAS.

**ASPIC.** A dish consisting of a clear savoury meat jelly, containing fowl, game, fish, etc.

**ASPIDISTRA.** A genus of plants of the lily family, comprising three or four species, natives of China and Japan, being plants with large smooth oblong lanceolate leaves, rising from an underground rhizome, and with campanulate flowers of a dull purplish or brownish colour. They are now very common in Britain, being especially cultivated as indoor plants.

**ASPID'IUM.** A genus of ferns, nat. ord. Polypodiaceæ, comprising the shield-fern and male-fern.

**AS'PINWALL.** *See* COLON.

**AS'PIRATE.** A name given to any sound like our *h*, to the letter *h* itself, or to any mark of aspiration, as the Greek rough breathing (ʽ). Such characters or sounds as the Sanskrit *kh*, *gh*, *bh*, and the Greek *ch*, *th*, *ph*, are called *aspirates*.

**AS'PIRATOR.** An instrument used to promote the flow of a gas from one vessel into another by means of a liquid. The simplest form of aspirator is a cylindrical vessel containing water, with a pipe at the upper end which communicates with the vessel containing the gas, and a pipe at the lower end also, with a stopcock and with its extremity bent up. By allowing a portion of the water to run off by the pipe at the lower part of the aspirator a measured quantity of air or other gas is sucked into the upper part.

**ASPIRIN.** Drug efficacious for giving relief to pain, especially from neuralgia, sciatica, lumbago and rheumatism, as well as for headaches and feverish colds. It is a white crystalline substance, not easily soluble in water, and is called by chemists acetylsalicylic acid. It is usually taken in tablet form. The dose is from 5 to 15 grains. If taken for a cold, the patient should go at once to bed as the drug tends to cause sweating. If taken regularly for a long period aspirin loses some of its beneficial effects, and tends to depress the action of the heart.

**ASPLE'NIUM.** A genus of ferns, of the nat. ord. Polypodiaceæ. Nine species are found in Britain, among them the well-known Wall-rue.

**ASPROMON'TE.** A mountain of Italy in the south-west of Calabria, where Garibaldi was wounded and taken prisoner with the greater part of his army, in Aug., 1862.

**ASPROPOT'AMO.** *See* ACHELOUS.

Herbert Henry Asquith, 1st Earl of Oxford

**ASPULL.** A town (urban district) of England, Lancashire, 2 or 3 miles north-east of Wigan, with collieries and other works. Pop. (1931), 7193.

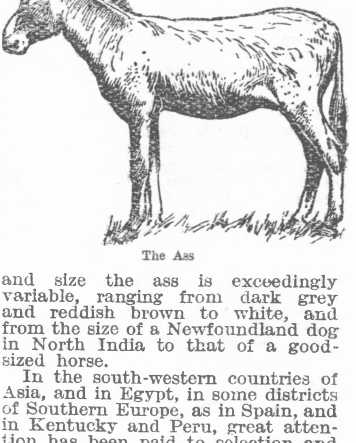
**ASQUITH, Herbert Henry, 1st Earl of Oxford and Asquith, K.G.** Was born in 1852, and educated at City of London School and Balliol College, Oxford, where he graduated with high distinction. Called to the Bar in 1876, he became Q.C. in 1890; in 1886 was elected member of Parliament for East Fife, and held his seat for this constituency uninterruptedly until Dec., 1918, when he was defeated. From 1892 to 1895 he was Home Secretary, being also made a Privy Councillor in the former year. Both in regard to the South African War and various other questions, when out of office, he spoke more in harmony with the views of Lord Rosebery than with those of Sir H. Campbell-Bannerman, but under the latter he accepted the post of Chancellor of the Exchequer in the ministry formed in Dec., 1905.

On the retirement of Sir Henry in 1908 he succeeded him as Prime Minister. He at once hastened to draw up the Liberal reform programme, the list of measures including the Lloyd George Budget (1909), the Parliament Act (1911), the Insurance Act, and the Irish Home Rule Bill. With the outbreak of the Great War in August, 1914, the Irish difficulty was temporarily set aside. No formal change was made in the political constitution of the Cabinet till May, 1915, when Mr. Asquith formed the first coalition ministry, himself retaining the Premiership. The public dissatisfaction with the way the war was being conducted which had made this step necessary was little abated, and by Dec., 1916, Mr. Asquith was forced to resign, and Mr. Lloyd George formed a new ministry.

In the General Election of 1918 Mr. Asquith lost his seat. Two years later he was elected member for Paisley and retained this seat till 1924. He was created Earl of Oxford and made K.G. in 1925. In 1926 he resigned the leadership of the Liberal party. He died in 1928.

**AS'RAEL.** The Mahommedan angel of death, who takes the soul from the body.

**ASS** (*Equus asinus*). A species of the horse genus, supposed by Darwin to have sprung from the wild variety (*Asinus tœniopus*) found in Abyssinia; by some writers to be a descendant of the *onager* or wild ass, inhabiting the mountainous deserts of Tartary, etc.; and by others to have descended from the kiang or djiggetai (*A. hemionus*) of South-Western Asia. The ass was used in Egypt long before the horse, and it played an important part in Homeric Greece. According to Aristotle, however, it was unknown in his time in Pontus, Scythia, and in the land of the Celts. The ass seems to have been introduced into England in the days of Ethelred, but did not become common before the end of the seventeenth century. Both in colour



The Ass

and size the ass is exceedingly variable, ranging from dark grey and reddish brown to white, and from the size of a Newfoundland dog in North India to that of a good-sized horse.

In the south-western countries of Asia, and in Egypt, in some districts of Southern Europe, as in Spain, and in Kentucky and Peru, great attention has been paid to selection and interbreeding, with a result no less remarkable than in the case of the horse. Thus in Syria there appear to be four distinct breeds: a light and graceful animal used by ladies, an Arab breed reserved for the saddle, an ass of heavier build in use for ploughing and draft purposes, and the large Damascus breed. The efforts made to raise the deteriorated British breed have only been partially successful. The male ass is mature at two years of age, the female still earlier. The she-ass carries her young eleven months. The teeth of the young ass follow the same order of appearance and renewal as those of the horse.

The life of the ass does not usually exceed thirty years. It is in general much healthier than the horse, and is maintained in this condition by a smaller quantity and coarser quality of food; it is superior to the horse in its ability to carry heavy burdens over the most precipitous roads,

and is in no respect its inferior in intelligence, despite the reputation for stupidity which it has borne from very ancient times. The skin is used as parchment to cover drums, etc., and in the East is made into shagreen.

The hybrid offspring of the horse and the female ass is the hinny, that of the ass and the mare is the mule; but the latter is by far the larger and more useful animal. Asses' milk, long celebrated for its sanative qualities, more closely resembles that of a woman than any other. It is very similar in taste, and throws up an equally fluid cream, which is not convertible into butter.

**ASSAB'.** A bay of Africa on the south-west coast of the Red Sea, belonging to the Italian territory of Eritrea, which has been acquired since Italy established here a colony and free port in 1881.

**ASSAFŒTIDA.** *See* ASAFETIDA.

**ASSAI-PALM** (as-ī'; *Euterpe oleracea*). A native of tropical S. America, only about 4 inches in diameter and 60 or 80 feet high, with a crown of leaves, beneath which a small fruit grows on branched horizonal spadices. The pulp of the fruit mixed with water is used as a beverage.

**ASSAL'.** A salt lake in North-Eastern Africa, in Adal.

**ASSAM'.** One of the fifteen provinces of British India, separated from Eastern Bengal and reconstituted in 1912; area, 53,015 sq. miles. It forms a series of fertile valleys watered by the Brahmaputra and its tributaries, the valley of the Brahmaputra, which is the main one, consisting of rich alluvial plains, either but little elevated above the river, or so low that large extents of them are flooded for three or four days once or twice in the year, while the course of the river often changes. The climate is marked by great humidity, and malarious diseases are common in the low grounds; otherwise it is not unhealthy. The whole province, except the cultivated area, may be designated as forest, the trees including teak, sâl, sissoo, the date and sago palm, the areca palm (the betel-nut tree), the Indian fig tree, etc.

The article of most commercial importance is tea, which was first exported in 1838, and the yield of which is now over 100,000,000 pounds annually. Other crops raised are rice, Indian corn, pulse, oil-seeds, sugar-cane, hemp, jute, potatoes, etc. In the jungles and forests roam herds of elephants, the rhinoceros, tiger, buffalo, leopard, bear, wild hog, jackal, fox, goat and various kinds of deer. Among serpents are the python and the cobra. Pheasants, partridges, snipe, wild peacock, and many kinds of water-fowl abound. Coal, petroleum, and limestone are found in abundance; iron is smelted to a small extent; gold-dust is met with; lime is exported to Bengal.

There is no single Assamese nationality, and the Assamese language is merely a modern dialect of Bengali. Pop. 7,606,230, 4,000,000 of whom are Hindus, 2,000,000 Mahommedans, 70,000 Christians, 10,000 Buddhists, the rest being chiefly hill tribes of aboriginal faiths. The labourers in the tea-gardens are mostly drawn from Bengal. In 1826 Assam became a possession of Britain, being taken from the Burmese, who had made themselves masters of it about the end of the eighteenth century. The capital of the province is Shillong.—Cf. E. A. Gait, *History of Assam*.

**AS'SAPAN** (*Sciuropterus volucella*). The flying-squirrel of N. America, a little animal with folds of skin along its sides which enable it to take leaps of 40 or 50 yards.

**ASSASS'INS** (from *hashshāshin*, drinkers of *hashish*). An Asiatic order or society having the practice of assassination as its most distinctive feature, founded by Hassan Ben Subbah, the Himyarite, a *dai* or missionary of the heterodox Mahommedan sect the Ismailites. The society grew rapidly in numbers, and in 1090 the Persian fortress of Alamut fell into their hands. Other territories were added, and the order became a recognized military power. Its organization comprised seven ranks, at its head being the Sheikh-al-Jebala or "Old man of the mountains." Upon a select band fell the work of assassination, to which they were stimulated by the intoxicating influence of *hashish*. For nearly two centuries they maintained their power under nine sheikhs. Hassan, after a long and prosperous reign, died in 1124. Most of his successors died violent deaths at the hands of relatives or dependents.

After proving themselves strong enough to withstand the powerful sultans Noureddin and Saladin, and making themselves feared by the Crusaders, the *Assassins* were overcome by the Tartar leader Hulaku. The last chief, Rokneddin, was killed for an act of treachery subsequent to his capture, and his death was followed by a general massacre of the assassins, in which 12,000 perished. Dispersed bands led a roving life in the Syrian mountains, and it is alleged that in the Druses and other

small existing tribes their descendants are still to be found. *See* CRUSADES; KHOJA.

**ASSAULT'.** In law, an attempt or offer, with force and violence, to do a corporal hurt to another, as by striking at him with or without a weapon. If a person lift up or stretch forth his arm and offer to strike another, or menace anyone with any staff or weapon, it is an assault in law. Assault, therefore, does not necessarily imply a hitting or blow, because in trespass for assault and battery a man may be found guilty of the assault and acquitted of the battery. But every battery includes an assault.

**ASSAYE,** or **ASSYE** (as-sī'). A village in Southern India, in Hyderabad, where Wellington (then Major-General Wellesley) gained a famous victory in 1803. With only 4500 troops at his disposal he completely routed the Mahratta force of 50,000 men and 100 guns. The victory, however, cost him more than a third of his men.

**ASSAYING.** The estimation of the amount of pure metal present in an ore or an alloy. The term was originally applied to testing of gold and silver only. It is now usually applied to the determination of the quantity of valuable metal in an ore or alloy, and is also sometimes applied to the estimation of any element which may affect the value of the ore.

Assaying, therefore, means the estimation of one or more metals in an ore or alloy. Before an assay can be made, an average sample of the material must be obtained. If an ore, pieces of material are taken from different parts of the vein or, if already mined, from different parts of the dump. The pieces are crushed up finely and divided into four equal parts. Two of these parts are then mixed and divided into four again, and so on until an average sample has been obtained.

In the case of metals in ingots or bars, samples are obtained by drilling and chipping corners or edges. Coins, which are never homogeneous, may be rolled out into a thin sheet and cut into small pieces. A preliminary examination is made to determine the constituents. Finally an assay of the substance is made. The methods used are determined by the metals and the proportions of these present in the ore or alloy. Originally the term assaying was applied to dry methods, i.e. the substance was heated in a special crucible with a suitable flux, and a bead of metal was obtained which was weighed. An assay now may be carried out in various ways, for example, by fusing with a reducing agent and obtaining a bead of metal, or by dissolving the substance to be assayed in suitable solvent and precipitating the metal as an insoluble salt, or volumetric methods may be used.

Dry assaying is still used for gold. The assay depends on first heating the gold ore or alloy with lead in a porous crucible, that is, *cupelling* it. Lead oxidizes on heating in a furnace; part volatilizes, and part of the oxide is absorbed by the cupel and carries with it oxides of other metals with the exception of gold and silver. The porportion of lead must be regulated, depending on the metals alloyed with gold.

A bead is obtained containing gold and silver. This is beaten out into a thin plate, and then rolled out until it is thin enough to be rolled up by hand. The gold alloy is rolled up in the fingers into a cornette and treated with nitric acid. This dissolves silver, leaving a brittle cornette of gold, which is thoroughly washed, dried, and weighed. All gold alloys and silver alloys must be assayed, and their fineness stamped on them. The Goldsmith's Company of London is the statutory assay-master of England.—BIBLIOGRAPHY: C. and J. J. Beringer, *A Text-book of Assaying*; E. A. Wraight, *Assaying in Theory and Practice*; J. Park, *A Text-book of Practical Assaying.*

**AS'SEGAI** (from Ar. *as-zahayah*). A spear used as a weapon among the Kaffirs of S. Africa, made of hard wood tipped with iron, and used for throwing or thrusting.

**ASSEMBLY, GENERAL.** The supreme ecclesiatical court of the Established Church of Scotland, consisting of delegates from every prebytery, university, and royal burgh in Scotland. It has the countenance of a representative of the king, styled the Lord High Commissioner, who is generally a nobleman. It holds its meetings annually and (according to the present practice) in the month of May, usually sitting for ten or twelve days. In its judicial capacity as a court of review, and as the court of last resort, the General Assembly has a right to determine finally every question brought from the inferior courts, by reference, complaint, or appeal.

It possesses, besides, a general superintendence of the discipline of the Church, of the management of the inferior courts, of the conduct of the clergy, and of the morals of the people. In its legislative capacity it

has the power of enacting statutes with regard to every subject of ecclesiastical cognizance, which are binding on the Assembly itself, on the inferior courts, and on the individual members of the Church. But by an Act of Assembly in 1697, from its substance and design named the Barrier Act, every proposition for a new law must first be considered in the form of an overture; and though it should be approved of by the Assembly it cannot be enacted as a statute till it has been first transmitted to the several presbyterics of the Church for their consideration, and has received the sanction of at least a majority of the presbyteries. The United Free Church of Scotland has also a General Assembly similar in its constitution and functions to that of the Established Church, and the same is the case with the Presbyterian Churches of Ireland and America.

**ASSEMBLY, NATIONAL** (France). A body set up in France on the eve of the Revolution. Upon the convocation of the States-General by Louis XVI. the privileged nobles and clergy refused to deliberate in the same chamber with the commons or *tiers-état* (third estate). The latter, therefore, on the proposition of the Abbé Siéyès, constituted themselves an *assemblée nationale*, with legislative powers (17th June, 1789). They bound themselves by oath not to separate until they had furnished France with a constitution, and the Court was compelled to give its assent. In the 3250 decrees passed by the Assembly were laid the foundations of a new epoch, and, having accomplished this task, it dissolved itself, 30th Sept., 1791.

**ASSEMBLY OF DIVINES.** *See* WESTMINSTER ASSEMBLY.

**ASSEMBLY, THE RIGHT OF.** Is an essential principle of popular government, as understood by the British and American constitutions. The right of British citizens to assemble peaceably for any purpose which is not strictly prohibited by law is implied in the right of petition, as affirmed in the Bill of Rights (q.v.). Unlawful assembly, which is a criminal offence, is distinguished from the offence of riot. Whilst the latter is an actual attempt to carry an unlawful purpose into effect, the former is defined as "an assembly with intent to carry out a common purpose which may lead to a breach of the peace."

**AS'SEN.** Chief town of the province of Drenthe, Holland. Pop. 13,000.

**ASSENT', THE ROYAL.** Is the approbation given by the sovereign in Parliament to a Bill which has passed both Houses, after which it becomes a law. It may either be done in person, when the sovereign comes to the House of Peers and the assent (in Norman French) is declared by the Clerk of Parliament; or it may be done by letters-patent under the great seal, signed by the sovereign.

**AS'SER, John.** A learned British ecclesiastic, originally a monk of St. David's, distinguished as the instructor, companion, and biographer of Alfred the Great, who appointed him abbot of two or three different monasteries, and finally Bishop of Sherborne, where he died in 908 or 910. His life of Alfred, written in Latin in 893 (*Annales Rerum Gestarum Ælfredi Magni*), is of very great value, though its authenticity has been questioned. There are several English translations of it.

**ASSESSED TAXES.** Taxes charged upon persons by means of a schedule or paper sent to each, and strictly including such taxes as the income-tax, the house-tax, local rates, etc. In Britain the so-called assessed taxes include those upon servants, carriages, dogs, armorial bearings, etc., though these are really excise licence duties.

**ASSES'SOR.** A person appointed to ascertain and fix the amount of taxes, rates, etc.; or a person who sits along with the judges in certain courts, and assists them with his professional knowledge.

**AS'SETS** (Fr. *assez*, enough). Property or goods available for the payment of a bankrupt or deceased person's obligations. Assets are personal or real, the former comprising all goods, chattels, etc., devolving upon the executor as saleable to discharge debts and legacies. In commerce and bankruptcy the term is often used as the antithesis of "liabilities," to designate the stock in trade and entire property of an individual or an association.—*Intangible* (or fictitious) assets are those not represented by any existing value, e.g. goodwill; *liquid* assets are cash, investments, or other immediately available funds.

**ASSIDE'ANS, HASIDE'ANS,** or **HASIDIM** ("the pious"). One of the two great sects into which, after the Babylonish captivity, the Jews were divided with regard to the observance of the law—the Hasidim accepting it in its later developments, the Zadikim professing adherence only to the law as given by Moses.

*See* PHARISEES, TALMUDISTS, RABBINISTS.

**ASSIEN'TO.** The permission of the Spanish Government to a foreign nation to import negro slaves from Africa into the Spanish colonies in America, for a limited time, on payment of certain duties. It was accorded to the Netherlands about 1552, to the Genoese in 1580, and to the French Guinea Company (afterwards the Assiento Company) in 1702. In 1713 the celebrated *Assiento Treaty* with Britain for thirty years was concluded at Utrecht. By this contract the British obtained the right to send yearly a ship of 500 tons, with all sorts of merchandise, to the Spanish colonies. This led to frequent abuses and contraband trade; acts of violence followed, and in 1739 a war broke out between the two Powers. At the peace of Aix-la-Chapelle, in 1748, four years more were granted to the British; but by the Treaty of Madrid, two years later, £100,000 sterling were promised for the relinquishment of the two remaining years, and the contract was annulled.

**ASSIGNATS** (ás-ē-nyà). The name of the national paper currency in the time of the French Revolution. Assignats to the value of 400,000,000 francs were first struck off by the Constituent Assembly, with the approbation of the king, 19th April, 1790, to be redeemed with the proceeds of the sale of the confiscated goods of the Church. On the 27th Aug. of the same year Mirabeau urged the issuing of 2,000,000,000 francs of new assignats, which caused a dispute in the Assembly. Vergasse and Dupont, who saw that the plan was an invention of Clavière for his own enrichment, particularly distinguished themselves as the opponents of the scheme. Mirabeau's exertions, however, were seconded by Péthion, and 800,000,000 francs more were issued. They were increased by degrees to 45,578,000,000, and their value rapidly declined.

In the winter of 1792-3 they lost 30 per cent, and, in spite of the law to compel their acceptance at their nominal value, they continued to fall, till in the spring of 1796 they had sunk to one three hundred and forty-fourth their nominal value. This depreciation was due partly to the want of confidence in the stability of the Government, partly to the fact that the coarsely-executed and easily-counterfeited assignats were forged in great numbers. They were withdrawn by the Directory from the currency, and at length redeemed by mandats at one-thirtieth of their nominal value.

**ASSIGNEE'.** A person appointed by another to transact some business, or exercise some particular privilege or power. Formerly the persons appointed under a commission of bankruptcy, to manage the estate of the bankrupt on behalf of the creditors, were so called, but now they are called *trustees*.

**ASSIGN'MENT.** Is a transfer by deed of any property, or right, title, or interest in property, real or personal. Assignments are usually given for leases, mortgages, and funded property.

**ASSINIBOI'A.** The smallest of the four districts into which that portion of the north-western territories of Canada now forming the provinces of Saskatchewan and Alberta was divided in 1882. It lay on the west of Manitoba, with Saskatchewan on the north and Alberta on the west, the United States on the south. The name is now given to an electoral district of the province of Saskatchewan. The region contains much good wheat land. Regina was the capital, as it now is of the new province.

**ASSINIBOINE.** A river of Canada, which flows through Manitoba and joins the Red River at Winnipeg, about 40 miles above the entrance of the latter into Lake Winnipeg, after a somewhat circuitous course of about 500 miles from the west and north-west. Steamers ply on it for over 300 miles.

**ASSIOUT.** *See* SUDAN and EGYPT.

**ASSISI** (ás-sē'sē). A small town in Italy, in the province of Umbria, 20 miles north of Spoleto, the see of a bishop, and famous as the birthplace of St. Francis d'Assisi. The splendid church built over the chapel where the saint received his first impulse to devotion is one of the finest remains of mediæval Gothic architecture.

**ASSI'ZES.** A term chiefly used in England and Wales to signify the sessions of the courts held at Westminster prior to Magna Charta, but thereafter to the courts held by the King's Judges and others appointed to be commissioners of assize in the counties. The Judges of the King's Bench Division of the High Court of Justice in England, twice in every year perform a *circuit* into all the counties (the counties being grouped into seven circuits), to hold these assizes, at which both civil and criminal cases are decided.

Revenue and certain matrimonial causes may now be heard at assizes. Occasionally this circuit is performed a third time for the purpose of gaol-

delivery. In London and Middlesex there are no assizes, so called, but civil and criminal cases are heard and decided in the High Court and the Central Criminal Court respectively. Power to regulate circuits and the business at assizes by Order in Council is given by the Supreme Court of Judicature (Consolidation) Act, 1925. In Scotland the term *assize* is still used to denote the jury in criminal cases.

Among the more important historic uses of the term *assize* are its application to any sitting or deliberative council, and its transference thence to their ordinances, decrees, or assessments. In the latter sense we have the Assizes of Jerusalem, a code of feudal laws formulated in 1099 under Godfrey of Bouillon; the Assizes of Clarendon (1166), of Northampton (1176), and of Woodstock (1184).

**ASSOCIATED COUNTIES.** A term applied to Essex, Cambridge, Norfolk, Suffolk, and Hertford, with, subsequently, Huntingdon and Lincoln. The association was formed in 1642 to raise an army for the Parliament and keep the war out of their own districts. The successive leaders were Lord Grey of Wark, the Earl of Manchester, and Cromwell.

**ASSOCIATION CUP.** Trophy awarded every year to a club playing football according to the rules of the Football Association. It was first given in 1871 and has increased steadily in popularity ever since then. There are preliminary rounds in which the weaker clubs are weeded out, and six rounds in the competition proper. From the first two of these the stronger clubs are excused, but they come into the third round in which there are 64 competitors. These are reduced by the sixth round to four, and the four play in the semi-finals, and the victorious two in the final. Since 1923 the final has been played at the Stadium at Wembley.

WINNERS OF THE ASSOCIATION CUP SINCE 1900.

| | |
|---|---|
| 1900 Bury | 1915 Sheffield United |
| 1901 Tottenham Hots. | 1920 Aston Villa |
| 1902 Sheffield United | 1921 Tottenham Hots. |
| 1903 Bury | 1922 Huddersfield |
| 1904 Manchester City | 1923 Bolton Wand. |
| 1905 Aston Villa | 1924 Newcastle United |
| 1906 Everton | 1925 Sheffield United |
| 1907 Sheffield Wednes. | 1926 Bolton Wand. |
| 1908 Wolverh'm't'n Wan. | 1927 Cardiff City |
| 1909 Manchester United | 1928 Blackburn Rovers |
| 1910 Newcastle United | 1929 Bolton Wand. |
| 1911 Bradford City | 1930 Arsenal |
| 1912 Barnsley | 1931 W. Brom. Albion |
| 1913 Aston Villa | 1932 Newcastle United |
| 1914 Burnley | 1933 Everton |

**ASSOCIATION OF IDEAS.** A doctrine of both psychological and philosophical import. In psychology the term is used to comprise the conditions under which one idea is able to recall another to consciousness. It is, therefore, the doctrine which deals with the reproduction of past experience by a present object of consciousness. The phrase "association of ideas" was first introduced by Locke, and dealt with by Berkeley and Hartley, who became the founder of the so-called *Associationist School.*

**ASS'ONANCE.** In poetry, a term used when the terminating words of lines have the same vowel sound but make no proper rhyme. Such verses, having what we should consider false rhymes, are regularly employed in Spanish poetry; but cases are not wanting in leading British poets. Mrs. Browning not only used them frequently, but justified the use of them.

**ASSOUAN** (ȧs-sō-ȧn'), or **ASWAN** (*Syēnē*). A town of Upper Egypt, on the east bank of the Nile, below the first cataract, opposite the Island of Elephantine. The granite quarries of the Pharaohs are here. Pop. (1927), 16,366.

**ASSOUAN DAM.** A great dam constructed across the Nile in Upper Egypt, near Assouan, at the foot of the first cataract. It is about a mile and a quarter long, and is provided with a large number of sluices in two tiers. It was originally built to a height of about 96 feet between 1898 and 1902, and raised to a height of 112 feet above bed-rock between 1907 and 1911. It is intended to regulate the supply of water for irrigation purposes to the country lower down, the water being stored up at the time when the river is high, and allowed to escape when it is required for the crops. When

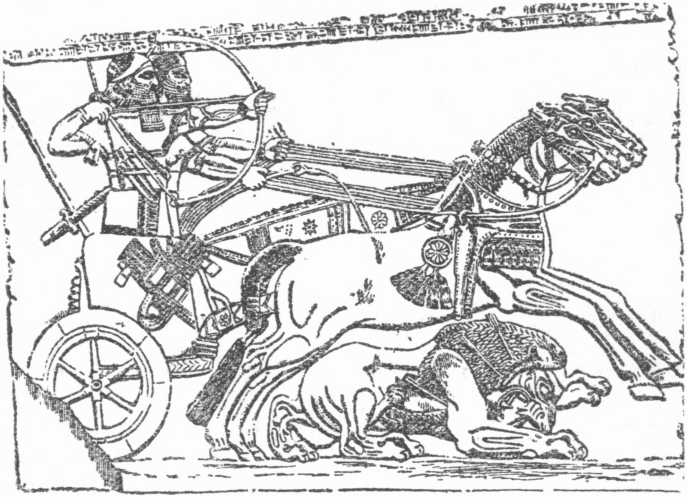
Assyrian Soldiers.

the reservoir is full it forms a lake about 130 miles long. The dam was

planned by Sir William Willcocks, and the work carried out under Sir William Garstin and Sir Benjamin Baker, at a cost of £5,000,000 (Egyptian).

**ASSUMP'SIT.** In English law, an action to recover compensation for the non-performance of a *parole* promise; that is, a promise not contained in a deed under seal. Assumpsits are of two kinds, *express* and *implied*. The former are where the contracts are actually made in word or writing; the latter are such as the law implies from the justice of the case; e.g. employment to do work implies a promise to pay.

**ASSUMPTION.** *See* ASUNCION.



Assyrian bas-relief from the Palace of Nimrud showing Lion-hunting about 884 B.C.

**ASSUMPTION, FEAST OF.** The ecclesiastical festival celebrating the miraculous ascent into Heaven of the Virgin Mary's body as well as her soul, kept on the 15th of August. The legend first appeared in the third or fourth century, and the festival was instituted some three centuries later.

**ASSURANCE.** *See* INSURANCE.

**ASSYR'IA** (the **ASSHUR** of the Hebrews, **ATHURÂ** of the ancient Persians). An ancient monarchy in Asia, intersected by the upper course of the Tigris, and having the Armenian Mountains on the north and Babylonia on the south; area, about 50,000 sq. miles; surface partly mountainous, hilly, or undulating, partly a portion of the fertile Mesopotamian plain. The numerous remains of ancient habitations show how thickly this vast flat must have once been peopled; now, for the most part, it is a mere wilderness. Geographically and historically, however, Assyria and Babylonia are interdependent, and the Assyrians and Babylonians are ethnographically and linguistically the same race. Whereas, however, the classical authors speak of Assyria to the exclusion of Babylonia, the decipherment of the inscriptions has proved that Babylonia was the mother-country, and that Assyria, except during a period of eight centuries, was a dependency of the former. This discovery coincides with the contents of the tenth chapter of Genesis. *See* BABYLONIA.

**AST, Georg Anton Friedrich.** German philosopher, 1776-1841. He wrote on æsthetics and the history of philosophy, but is best known as an editor of Plato, whose works he published with a Latin translation and commentary.

**AS'TACUS.** *See* CRAYFISH.

**ASTAR'TE.** A Syrian goddess, probably corresponding to the *Ashtaroth* of the Hebrews, and representing the productive power of nature. She was a moon-goddess. Some regard her as corresponding to

*Hera* (*Juno*), and others identify her with *Aphroditē*.

**ASTATIC NEEDLE.** A magnetic needle having another needle of the same intensity fixed parallel to it, the poles being reversed, so that the needles neturalize one another, and are unaffected by the earth's magnetism; used in the *astatic galvanometer*.

**AS'TER.** A genus of plants, nat. ord. Compositæ, comprehending several hundred species, scattered over Europe and Asia, but mostly natives of North America. Many are cultivated as ornamental plants. One, *A. Tripolium*, is native in Britain, and is found in salt marshes, having a pretty purple flower. Asters generally flower late in the season, and some are hence called Michaelmas or Christmas Daisies. The China Aster, not an aster proper (*Aster* or *Callistéphus chinensis*), is a very showy annual, of which there are many varieties.

**ASTERABAD'.** *See* ASTRABAD.

**ASTE'RIA.** A name applied to a variety of corundum, which displays an opalescent star of six rays of light when cut with certain precautions; and also to the *cat's-eye*, which consists of quartz, and is found especially in Ceylon.

**ASTER'IDÆ.** *See* ASTEROIDEA.

**AS'TERISK.** The figure of a star, thus *, used in printing and writing, as a reference to a passage or note in the margin, or to fill the space when a name, or the like, is omitted.

**ASTEROI'DEA.** The ord. of the Echinodermata to which the starfishes belong. *See* STAR-FISHES.

**AS'TEROIDS, PLANETOIDS,** or **MINOR PLANETS.** A numerous group of very small planets revolving round the sun, in the great majority of cases at mean distances, intermediate between those of Mars and Jupiter, in orbits of large eccentricity at considerable inclination to the ecliptic. The diameter of the largest is not supposed to exceed 450 miles, while most of the others are very much smaller. Over one thousand are known, and new members are being constantly discovered. The first to be discovered was Ceres, on 1st Jan., 1801, and within seven years more Pallas, Juno, and Vesta were seen.

The diminutive size of these four bodies, and resemblances in their orbits, gave rise to the opinion that they were but the fragments of a planet that had formerly existed and had been brought to an end by some catastrophe. For nearly forty years investigations were carried on, but no more planets were discovered till 8th Dec., 1845, when a fifth planet in the same region of the solar system was discovered. The rapid succession of discoveries that followed was for a time taken as a corroboration of the disruption theory, but the breadth of the zone occupied makes the hypothesis of a shattered planet more than doubtful.

In recent years a few have been discovered which are at times considerably within the orbit of Mars, the nearest perihelia being less than 15 million miles beyond the earth's orbit. Another group, known as the "Trojan Planets," has been found, whose mean distances are practically identical with that of Jupiter. The total mass of the asteroids cannot exceed one-fourth that of the earth, and is probably much less. *See* PLANETS.

**ASTEROL'EPIS.** A genus of primitive ganoid fishes, found only in a fossil state in the Old Red Sandstone. They were about 1 foot long, and the head and body were enclosed in armour of strong bony plates.

**ASTHMA** (ast'ma). Difficulty of respiration, returning at intervals, with a sense of stricture across the chest and in the lungs, a wheezing, hard cough at first, but more free towards the close of each paroxysm, with a discharge of mucus, followed by a remission. Asthma is essentially a spasm of the muscular tissue which is contained in the smaller bronchial tubes. It generally attacks persons advanced in years, and seems, in some instances, to be hereditary.

The exciting causes are various—accumulation of blood or viscid mucus in the lungs, noxious vapours, a cold and foggy atmosphere, or a close, hot air, flatulence, accumulated fæces, violent passions, organic diseases in the thoracic viscera, etc. In recent years a treatment first used by Dr. Alexander Francis has come into prominence. By far the most important part of the treatment consists on obviating or removing the several exciting causes. It seldom proves fatal except as inducing dropsy, consumption, etc.

**ASTI** (às'tē). A town of Northern Italy, province of Alessandria, 28 miles E.S.E. of Turin, the see of a bishop, with an old cathedral. In the Middle Ages it was one of the most powerful republics of Northern Italy. It was the birthplace of Alfieri, the poet, whose statue adorns the principal square. There is also an equestrian statue of King Humbert. The industries comprise silk, matches, gold, mosaic wares, etc.

A favourite wine is produced in the neighbourhood. Asti, anciently *Asta*, was a place of some importance under the Roman emperors, and in the Middle Ages was an independent republic. Pop. 41,252.

**ASTIG'MATISM** (Gr. *a*, not, *stigma*, spot, mark). A malformation or imperfection, congenital or accidental, of the globe of the eye, in consequence of which the individual does not see objects clear and distinct, but with a blurred outline. It is due to the cornea or transparent outer coat of the eye not being regularly spherical, but having different degrees of curvature in different directions. Usually the degree of convexity is not the same horizontally as it is vertically, so that the rays from an object, instead of converging into one focus, meet in more than one.

If a person with this defect is looking at vertical lines crossed by horizontal ones he will see the one set more distinctly than the other, though a slight movement will enable him to see the other distinctly also, but not at the same time. Almost all eyes are more or less astigmatic, but persons only become aware of it when it is excessive. Special lenses are required to correct it—usually lenses plane in one direction and concave or convex in the other. Short sight or long sight is often associated with astigmatism, so that suitable spectacles cannot be very easily provided.

**ASTLE, Thomas.** English antiquary, born 1735, died 1803. He was a trustee of the British Museum and keeper of the public records in the Tower. His chief work, *The Origin and Progress of Writing*, appeared in 1784, and the portion dealing with mediæval handwriting is still of value. He formed a famous collection of MSS., the most valuable portion of which is now in the British Museum.

**ASTOM'ATA.** One of the two groups into which the Protozoa are divided with regard to the presence or absence of a mouth, of which organ the Astomata are destitute. The group comprises two classes, Gregarinida and Rhizopoda. *See* SPOROZOA; PROTOZOA.

**ASTON MANOR.** Formerly a municipal and parliamentary borough of Warwickshire, England, situated about 1½ miles E.N.E. of Birmingham, and engaged in similar branches of industry. It was incorporated with Birmingham in 1911 and gives its name to one of its parliamentary divisions. Pop. 75,029.

**ASTOR, John Jacob.** Born near Heidelberg, Germany, 1763, died at New York, 1848. In 1783 he emigrated to the United States, settled at New York, and became extensively engaged in the fur trade. In 1811 the settlement of Astoria, founded by him, near the mouth of the Columbia River, was formed to serve as a central depot for the fur trade between the lakes and the Pacific. He subsequently engaged in various speculations, and died worth £4,000,000, leaving £80,000 to found the Astor Library in New York. This institution is contained in a splendid building, enlarged in 1859 at the cost of his son, and comprises about 260,000 volumes. Since 1895 it has formed part of the New York public library.—His great-grandson, William Waldorf Astor, born in 1848, died in 1919, naturalized in England in 1899, was made a baron in 1916 and a viscount in 1917.

**ASTOR, LADY.** Nancy Witcher, Viscountess Astor, married the second Viscount Astor in 1906. She is a daughter of the late Colonel Chiswell Dabney Langhorne, of Virginia, United States. In Nov., 1919, she was elected member of Parliament for the Sutton division of Plymouth, and was again returned for the same constituency in 1922, 1923, and 1924. She was the first woman to take a seat in the House of Commons.

**ASTOR'GA.** A city of Spain, province of Leon; the *Asturica Augusta* of the Romans. It figured prominently during the Peninsular War; it was taken by the French after an obstinate defence, 1810, and retaken by the Spaniards, 1812. Pop. 5682.

**ASTO'RIA.** A town of Oregon, United States, on the Columbia River, with numerous salmon-canning establishments. Pop. 14,027. *See* ASTOR.

**ASTRABAD'.** A town of Persia, province of same name, about 24 miles E. of the Caspian. It was formerly the residence of the Kajar princes, the ancestors of the present Persian dynasty. It is very unhealthy, but is still the centre of a considerable trade. Pop. estimated at from 10,000 to 30,000. The province of Astrabad has an area of 5800 sq. miles, and a pop. of 150,000.

**ASTRÆ'A.** In Greek mythology, the daughter of Zeus and Themis, the goddess of justice. During the golden age she dwelt on earth, but on that age passing away she withdrew from the society of men and was placed among the stars, where she forms the constellation Virgo. The name was given to one of the asteroids, discovered in 1845. It revolves round the sun in 1511.10 solar days, and is

about 2½ times the distance of the earth from the sun.

**AS'TRAGAL.** In architecture, a small semi-circular moulding, with a fillet beneath it, which surrounds a column in the form of a ring, separating the shaft from the capital.

**ASTRAG'ALUS.** A genus of papilionaceous plants, herbaceous or shrubby, and often spiny.

**ASTRAG'ALUS.** The upper bone of the foot supporting the tibia; the huckle, ankle, or sling bone. It is a strong irregularly-shaped bone, and is connected with the others by powerful ligaments.

**ASTRAKHAN** (ăs-trȧ-*kȧn'*). A Russian city, capital of government of same name, on an elevated island in the Volga, about 30 miles above its mouth in the Caspian, communicating with the opposite banks of the river by numerous bridges. It is the seat of a Greek archbishop and has a large cathedral, as well as places of worship for Mahommedans, Armenians, etc. The manufactures are large and increasing, and the fisheries (sturgeon, etc.) very important. It is the chief port of the Caspian, and has regular steam communication with the principal towns on its shores. In 1919 the town was made a naval base by the Bolshevist Government of Moscow. Pop. (1926), 176,000, of various races.—The government (or province) has an area of 91,042 sq. miles. It consists almost entirely of two vast steppes, separated from each other by the Volga, and forming for the most part arid sterile deserts. In 1918 the district of Astrakhan proclaimed its automony and independence of Moscow. Pop. 1,427,500.

**ASTRAKHAN.** A name given to sheepskins with a curled woolly surface obtained from a variety of sheep found in Bukhara, Persia, and Syria; also a rough fabric with a pile in imitation of this.

**ASTRALITE.** *See* EXPLOSIVES.

**ASTRAL SPIRITS.** Spirits formerly believed to people the heavenly bodies or the aerial regions. In the Middle Ages they were variously conceived as fallen angels, souls of departed men, or spirits originating in fire, and belonging neither to heaven, earth, nor hell. Paracelsus regarded them as demoniacal in character.

**ASTRIN'GENT.** A medicine which contracts the organic textures and canals of the body, thereby checking or diminishing excessive discharges. The chief astringents are the mineral acids, alum, lime-water, chalk, salts of copper, zinc, iron, lead, silver; and among vegetables catechu, kino, oakbark, and galls.

**ASTROCA'RYUM.** A genus of tropical American palms, species of which yield oil and valuable fibre. Tucum oil and tucum thread are obtained from *A. vulgare*.

**AS'TROLABE.** An instrument formerly used for taking the altitude of the sun or stars, now superseded by the quadrant and sextant. The name was also formerly given to an armillary sphere. — Cf. Chaucer, *Treatise on the Astrolabe*.

**ASTROLABE BAY.** An inlet on the N.E. coast of Australian New Guinea.

**ASTROL'OGY.** Literally, the science or doctrine of the stars. The name was formerly used as equivalent to astronomy, but is now restricted in meaning to the pseudo-science which pretends to enable men to judge of the effects and influences of the heavenly bodies on human and other mundane affairs, and to foretell future events by their situations and conjunctions. As usually practised, the whole heavens, visible and invisible, were divided by great circles into twelve equal parts, called *houses*. As the circles were supposed to remain immovable, every heavenly body passed through each of the twelve houses every twenty-four hours. The portion of the zodiac contained in each house was the part to which chief attention was paid, and the position of any planet was settled by its distance from the boundary circle of the house, measured on the ecliptic.

The houses had different names and different powers, the first being called the house of life, the second the house of riches, the third of brethren, the sixth of marriage, the eighth of death, and so on. The part of the heavens about to rise was called the *ascendant*, the planet within the house of the ascendant being *lord of the ascendant*. The different *aspects* of the planets were of great importance. To *cast a person's nativity* (or *draw his horoscope*) was to find the position of the heavens at the instant of his birth, which being done, the astrologer, who knew the various powers and influences possessed by the sun, the moon, and the planets, could predict what the course and termination of that person's life would be.

The temperament of the individual was ascribed to the planet under which he was born, as *saturnine* from *Saturn*, *jovial* from *Jupiter*, *mercurial* from *Mercury*, etc., words which are

now used with little thought of their original meaning. The virtues of herbs, gems, and medicines were supposed to be due to their ruling planets. The history of astrology, which was the foster-sister of astronomy, goes back to the early days of the human race. Egyptians and Hindus, as well as the nations on the Euphrates and Tigris, were zealous astrologers.

The Christian Church strongly opposed the teachings of astrology, but its study spread among Jews and Arabs during the Middle Ages. Francis Bacon abused the astrologers of his day, and Swift wrote against them his famous *Prediction for the Year* 1708, *by Isaac Bickerstaff, Esq.* —BIBLIOGRAPHY: E. H. Bennet, *Astrology*; G. Wilde, *Chaldean Astrology Up-to-date*; A. Maury, *La Magie et l'astrologie à l'antiquité et au moyen âge*; A. J. Pearce, *Textbook of Astrology*.

**ASTRONOMER.** One who studies the heavenly bodies. In England there is an Astronomer Royal who has charge of the observatory at Greenwich. John Flamsteed was the first holder of the office. There is also an Astronomer Royal for Scotland, and one for the Cape of Good Hope. Other astronomers are in charge of the various university and other observatories.

**ASTRON'OMY** (from Gr. *astron*, a heavenly body, and *nemein*, to classify or arrange). Is that science which investigates the motions, distances, magnitudes, and various phenomena of the heavenly bodies. The science may be divided into several branches. *Descripitive astronomy* denotes merely a presentation of astronomical facts in a systematic but popular form; *pratical astronomy* treats of the instruments used in observing the celestial bodies, the methods of their employment, and the manner of deducing results from the observations; investigation of the causes of the motions of these bodies was formerly termed *physical astronomy*, but now generally *dynamical* or *gravitational astronomy*; *physical astronomy* or *astro-physics* is the comparatively modern branch which deals with their physical conditions, radiation, temperature, and chemical constitution.

Recent years have added two new fields of investigation which are full of promise for the advancement of astronomical science. The first of these—*celestial photography*—has furnished us with invaluable light-pictures of the sun, moon, and other bodies, and has recorded the existence of myriads of stars invisible even to the best telescopes; while the second, *spectrum analysis*, now employed by many scientists, reveals to us a knowledge of the physical constituents of the universe, telling us for instance that in the sun (or his atmosphere) there exist many of the elements familiar to us on the earth. It is also applied to the determination of the velocities with which stars are approaching, or receding from, our system; and to the measurement of movements taking place within the solar atmospheric envelopes. From analysis of some of the unresolved nebulæ the inference is drawn that they are not star-swarms but simply incandescent gas; whence a second inference results favourable to the hypothesis of the gradual condensation of nebulæ, and the successive evolutions of suns and systems.

The most remote period to which we can go back in tracing the history of astronomy refers us to a time about 2500 B.C., when the Chinese are said to have recorded the simultaneous conjunction of Saturn, Jupiter, Mars, Mercury, and the moon. This remarkable phenomenon is found, by calculating backward, to have taken place 2460 B.C. Astronomy has also an undoubtedly high antiquity in India. The mean annual motion of Jupiter and Saturn was observed as early as 3062 years B.C.; tables of the sun, moon, and planets were formed, and eclipses calculated. In the time of Alexander the Great, the Chaldeans or Babylonians had carried on astronomical observations for 1900 years. They regarded comets as bodies travelling in extended orbits, and predicted their return; and there is reason to believe that they had correct ideas regarding the solar system. The priests of Egypt gave astronomy a religious character; but their knowledge of the science is testified to only by their ancient zodiacs and the position of their pyramids with relation to the cardinal points.

It was among the Greeks that astronomy took a more scientific form. Thales of Miletus (born 639 B.C.) predicted a solar eclipse, and his successors held opinions which are in many respects wonderfully fully in accordance with modern ideas. Pythagoras (500 B.C.) and his followers formed theories of the planetary system. They taught the sphericity and revolution of the earth, but placed an imaginary "Central Fire," not the sun itself, at the centre of the system. Great progress was made in astronomy under the Ptolemies, and we find Timochares and Aristyllus employed about 300 B.C. in making useful planetary observations. But Aris-

tarchus of Samos (born 267 B.C.) is said, on the authority of Archimedes, to have far surpassed them, by teaching the double motion of the earth around its axis and around the sun. A hundred years later Hipparchus determined more exactly the length of the solar year, and the eccentricity of the ecliptic, discovered the precession of the equinoxes, and even undertook a catalogue of the stars.

It was in the second century after Christ that Cladius Ptolemy, a famous mathematician of Pelusium in Egypt, propounded the system that bears his name, viz. that the earth was the centre of the universe, and that the sun, moon, and planets revolved around it in the following order: nearest to the earth was the sphere of the moon; then followed the spheres of Mercury, Venus, the Sun, Mars, Jupiter, and Saturn; then came the sphere of the fixed stars; these were succeeded by two *crystalline* spheres and an outer sphere named the *primum mobile* or first movable, which last was again circumscribed by the *cœlum empyreum*, of a cubic shape, wherein happy souls found their abode. The Arabs began to make scientific astronomical observations about the middle of the eighth century, and for 400 years they prosecuted the science with assiduity. Ibn-Yunis (A.D. 1000) made important observations of the perturbations and eccentricities of Jupiter and Saturn.

In the sixteenth century Nicolaus Copernicus, born in 1473, introduced the system that bears his name, and which recognized the sun's central place in the solar system, and that all the other bodies, the earth included, revolve around it. This arrangement of the universe (see *Copernicus*) came at length to be generally received on account of the simplicity it substituted for the complexities and difficulties of the theory of Ptolemy. The observations and calculations of Tycho Brahe, a Danish astronomer, born in 1546, continued over many years, were of the highest value, and secured for him the title of regenerator of practical astronomy. His assistant and pupil, Kepler, born in 1571, was enabled, principally from the data provided by his master's labours, to arrive at those laws which have made his name famous: 1. That the planets move, not in circular, but in elliptical orbits, of which the sun occupies a focus. 2. That the radius vector, or imaginary straight line joining the sun and any planet, moves over equal spaces in equal times. 3. That the squares of the times of the revolutions of the planets are as the cubes of their mean distances from the sun.

Galileo, who died in 1642, advanced the science by his observations and by the new revelations he made through his telescopes, which established the truth of the Copernican theory. Newton, born in 1642, carried physical astronomy suddenly to comparative perfection. Accepting Kepler's laws as a statement of the facts of planetary motion, he deduced from them his theory of gravitation. The science was enriched towards the close of the eighteenth century by the discovery by Herschel of the planet Uranus and its satellites, the resolution of the Milky Way into myriads of stars, and the investigation of nebulæ and of double and triple stars. The splendid analytical researches of Lalande, Lagrange, Delambre, and Laplace mark the same period.

The nineteenth century opened with the discovery of the first four minor planets; and the existence of another planet (Neptune), more distant from the sun than Uranus, was, in 1845, independently predicted by Leverrier and Adams. Of late years the sun has attracted a number of observers, the spectroscope and photography having been especially fruitful in this field of investigation. By various methods the sun's mean distance has been ascertained within very small limits of error, and found to be nearly 93,000,000 miles. Many additions have been made to the known secondary planets or satellites, including some with retrograde motions. A vast number of asteroids has been discovered, and the width of the zone occupied by them found to be much more extensive. Much success has been achieved in ascertaining the parallax of fixed stars.

The objects with which astronomy has chiefly to deal are the earth, the sun, the moon, the planets, the fixed stars, comets, nebulæ, and meteors. The stellar universe is composed of an unknown host of stars, many millions in number. Those visible to the naked eye were in ancient times grouped into the constellations still recognized. The nebulæ are cloud-like patches of light scattered all over the heavens. Some of them have been resolved into star-clusters, but many of them are masses of incandescent gas. Of the so-called fixed stars, many form binary or multiple systems, the members revolving in orbits under each other's attractions, while other more scattered groups are moving clusters, travelling in parallel paths through

space like flocks of birds. Variable stars and extinct or dark stars are also known. The fixed stars preserve, at least to unaided vision, an unalterable relation to each other, because of their vast distance from the earth. Their apparent movement from east to west is the result of the earth's revolution on its axis in twenty-four hours from west to east.

The planets have not only an apparent, but also a real and proper motion, since, like our earth, they revolve around the sun in their several orbits and periods. The nearest of these bodies to the sun is *Mercury*. *Venus*, the second planet from the sun, is to us the brightest and most beautiful of all the planets. The *Earth* is the first planet accompanied by a satellite or moon. *Mars*, the next planet, has two satellites, discovered in 1877. Its surface has a variegated character, and the existence of land, water, snow, and ice has been inferred. The *Asteroids*, of which over 1000 are known, form a broad zone of small bodies, at distances from a little beyond the earth's to that of Jupiter. *Jupiter*, the largest planet, has at least nine satellites, of which the two outermost have retrograde motion. Its surface is diversified by spots, markings, and bands parallel to its equator. *Saturn*, with its nine or more satellites and broad thin rings in its equatorial plane, is, perhaps, the most striking telescopic object in the heavens. *Uranus*—discovered by Herschel in 1781—is accompanied by four satellites. *Neptune* is beyond Uranus. Most remote of all is the small planet *Pluto*, discovered in 1930. Besides the planets, quite a number of comets are known to be members of the solar system. The physical constitution of these bodies is still one of the enigmas of astronomy. The observation of meteors has recently attracted much attention. They are seen in largest numbers in the autumn months. Meteor streams are supposed to represent the results of the disintegration of comets. Among the more modern astronomers we may mention :—Gustav Kirchhoff, G. B. Donati, Christian Doppler, H. C. Vogel, Sir William Huggins, Simon Newcomb, and Sir David Gill. *See* EARTH, SUN, MOON, PLANET, COMET, STARS, ASTEROIDS, STELLAR PHOTOGRAPHY, SPECTROSCOPY, etc.—BIBLIOGRAPHY: Sir J. N. Lockyer, *Dawn of Astronomy*; Sir G. C. Lewis, *Historical Survey of the Astronomy of the Ancients*; Sir F. W. Dyson, *Astronomy*; Sir R. Ball, *Atlas, and Popular Guide to the Heavens*; G. P. Serviss, *Astronomy with an Opera-glass*; *The Pleasures of the Telescope*; A. M. Clerke, *History of Astronomy during the 19th Century*; H. Macpherson, *Romance of Modern Astronomy*; C. A. Young, *General Astronomy*; G. F. Chambers, *Handbook of Astronomy* (3 vols.); E. W. Maunder, *Astronomy of the Bible*; A. C. D. Crommelin, *The Star World*; Agnes Giberne, *Sun, Moon, and Stars* (popular).

**ASTROPALIA.** An island in the Ægean Sea. It was occupied during the Balkan war of 1912 by the Italians under Admiral Presbitero and General d'Ameglio.

**ASTROPHYSICS.** *See* SPECTROSCOPY.

**ASTUR.** *See* GOSHAWK.

**ASTU'RIA,** or **THE ASTURIAS.** A Spanish principality, now forming the province of Oviedo, on the north coast of Spain; an alpine region, with steep and jagged mountain ridges, valuable minerals, luxuriant grazing lands, and fertile well-watered valleys. The heir apparent of Spain bore, from 1388 until 1931, the title of Prince of the Asturias. *See* SPAIN.

**ASTY'AGES** (-jēz). Last king of the Medes, 593-558 B.C., deposed by Cyrus, an event which transferred the supremacy from the Medes to the Persians.

**ASUNCION** (â-sun-thō-on'), or **NUESTRA SEÑORA DE LA ASUNCION** (Eng. *Assumption*). The chief city of Paraguay, on the River Paraguay, picturesquely situated and with good public buildings. It was founded in 1537 on the feast of the Assumption. Its trade is mostly in the yerba tea, hides, tobacco, oranges, etc. It was taken and plundered by the Brazilians in 1869. A railway runs for a short distance into the interior. Pop. 99,836.

**AS'WAIL.** The native name for the sloth-bear (*Ursus labiatus*) of the mountains of India, an uncouth, unwieldy animal, with very long black hair, inoffensive when not attacked. Its usual diet consists of roots, bees'-nests, grubs, snails, ants, etc. Its flesh is in much favour as an article of food.

**ASWAN.** *See* ASSOUAN.

**ASY'LUM.** A sanctuary or place of refuge, where criminals and debtors sheltered themselves from justice, and from which they could not be taken without sacrilege. Temples were anciently asylums, as were Christian churches in later times. (*See* SANCTUARY). The term is now usually applied to an institution for

receiving, maintaining, and, so far as possible, ameliorating the condition of persons labouring under certain bodily defects or mental maladies; sometimes also a refuge for the unfortunate.

**ASYLUM, RIGHT OF.** *See* EXTRADITION.

**ASYMPTOTE** (as'im-tōt). In geometry, a line which is continually approaching a curve, but never meets it, however far either of them may be prolonged. This may be conceived as a tangent to a curve at an infinite distance. *See* CONIC SECTIONS.

**ASYN'DETON.** A figure of speech by which connecting words are omitted; as "I came, I saw, I conquered," or Cicero's "Abiit, excessit, evasit, erupit."

**ATACAMA** (ä-tä-kä'mä). A desert region on the west coast of S. America belonging to Chile, partly in the province of Atacama, partly in the territory of Antofagasta. It mainly consists of a plateau extending from Copiapo northward to the River Loa, and lies between the Andes and the sea. It forms the chief nitrate district of Chile, there being also rich silver-mines, while gold is also found, as well as argentiferous lead, copper, nickel, cobalt, and iron; with guano on the coast. The northern portion belonged to Bolivia until 1904. The Chilian province of Atacama has an area of 30,711 sq. miles, and a pop. of 48,413.

**ATACA'MITE.** A combination of the hydroxide and chloride of copper, occurring abundantly in some parts of South America, as at Atacama, whence it has its name. It is worked as an ore in South America, and is exported to England.

**ATAHUAL'PA.** The last of the Incas, succeeded his father in 1529 on the throne of Quito, whilst his brother Huascar obtained the kingdom of Peru. They soon made war against each other, when the latter was defeated, and his kingdom fell into the hands of Atahualpa. The Spaniards, taking advantage of these internal disturbances, with Pizarro at their head invaded Peru, and advanced to Atahualpa's camp. Here, while Pizarro's priest was telling the Inca how the Pope had given Peru to the Spaniards, fire was opened on the unsuspecting Peruvians, Atahualpa was captured, and, despite the payment of a vast ransom in gold, was executed (1533).

**ATALAN'TA.** In Greek mythology, a famous huntress of Arcadia. She was to be obtained in marriage only by him who could outstrip her in a race, the consequence of failure being death. One of her suitors obtained from Aphroditē (Venus) three golden apples, which he threw behind him, one after another, as he ran. Atalanta stopped to pick them up, and was not unwillingly defeated. There was another Atalanta belonging to Bœotia, who cannot very well be distinguished, the same stories being told about both.

**ATAMAN.** *See* HETMAN.

**AT'AVISM** (Lat. *atăbus*, an ancestor). In biology, the tendency to reproduce the ancestral type in animals or plants which have become considerably modified by breeding or cultivation; the reversion of a descendant to some peculiarity of a more or less remote ancestor. *See* MENDELISM, NATURAL SELECTION, EVOLUTION, HEREDITY. The term *atavism* is also frequently used in sociological literature, in the sense of reversion to more primitive types, as explanation of criminal instincts and pathological phenomena.

**ATAXY,** or **ATAXIA.** In medicine, irregularity in the animal functions, or in the symptoms of a disease. *See* LOCOMOTOR ATAXY.

**ATBA'RA.** The most northerly tributary of the Nile. It rises in the Abyssinian highlands, receives several large tributaries, and enters the Nile about 18° N. The town of Atbara is situated about 380 miles S.E. of Wadi Halfa. The battle of Atbara, between the British under Earl Kitchener (then Sir Herbert), and the followers of the Mahdi, was fought on 8th April, 1898.

**ATCHAFALAY'A** ("Lost Water"). A river of the United States, an outlet of the Red River which strikes off before the junction of that river with the Mississippi, flows southward, and enters the Gulf of Mexico by Atchafalaya Bay. Its length is about 225 miles.

**ATCHEEN'.** *See* ACHEEN.

**ATCH'ISON.** A city of Kansas, United States, on the Missouri, about 30 miles from Leavenworth, an important railway centre with an increasing trade. Pop. 12,630.

**A'TĒ.** Among the Greeks, the goddess of hate, injustice, crime, and retribution, daughter of Zeus according to Homer, but of Ēris (Strife) according to Hesiod.

**AT'ELES.** A genus of American monkeys. *See* SPIDER-MONKEY.

**ATELIERS NATIONAUX** (ä-tl-yā nä-syo-nō). Or national workshops, were established by the French

Provisional Government in 1848. They interfered much with private trade, as about 100,000 workmen threw themselves on the Government for work. The breaking up of the system led to disorders, but it was abolished in July, 1848.

**ATELLA'NÆ FAB'ULÆ** (called also **OSCAN PLAYS**). A kind of light interlude, in ancient Rome, performed not by the regular actors, but by freeborn young Romans; it originated from the ancient *Atella*, a city of the Oscans. They were the origin of the Italian *commedie dell'arte*. Cf. Munk, *De Fabulis Atellanis*.

**ATESH'GA** (the place of fire). A sacred place of the Guebres or Persian fire-worshippers, on the Peninsula of Apsheron, on the W. coast of the Caspian, visited by large numbers of pilgrims, who bow before the sacred flames which issue from the bituminous soil.

**ATH** (ät). A fortified town of Belgium, in the province of Hainaut, on the Dender; it carries on weaving, dyeing, and printing cottons. It was the scene of fighting in Nov., 1918. Pop. 11,108.

**ATHABAS'CA.** A river and lake of Canada. The river rises on the eastern slopes of the Rocky Mountains not far from Mount Hooker, in the province of Alberta, flows N.E. and N., and falls into Lake Athabasca after a course of about 600 miles.—**Lake Athabasca,** or Lake of the Hills, is about 190 miles S.S.E. of the Great Slave Lake, to which its waters are carried by means of the Slave River. It is about 200 miles in length from east to west, and 35 miles wide where widest, but narrows to a point at either extremity.—The former district of **Athabasca,** in 1905 divided between the two new provinces of Alberta and Saskatchewan, had British Colbumia on the west, Keewatin on the east, Alberta and Saskatchewan districts on the south, the parallel of 60° on the north, being crossed by the Athabasca and the Peace Rivers. Lake Athabasca is partly in Alberta, partly in Saskatchewan.

**ATHALI'AH.** Daughter of Ahab, King of Israel, and wife of Joram, King of Judah. After the death of her son Ahaziah, she opened her way to the throne by the murder of forty-two princes of the royal blood. She reigned six years; in the seventh the high-priest Jehoiada placed Joash, the young son of Ahaziah, who had been secretly preserved, on the throne of his father, and Athaliah was slain. Cf. 2 Kings, xi. The story of Athaliah supplied Racine with the plot of one of his most famous tragedies.

**ATHANA'SIAN CREED.** A creed or exposition of Christian faith, supposed formerly to have been drawn up by St. Athanasius, though this opinion is now generally rejected, and the composition often ascribed to Hilary, Bishop of Arles (about 430). It is an explicit avowal of the doctrines of the Trinity (as opposed to Arianism, of which Athanasius was a great opponent) and of the incarnation, and contains what are known as the "damnatory clauses," in which it declares that damnation must be the lot of those who do not believe the true and catholic faith. It is contained in the *Book of Common Prayer*, to be read on certain occasions.—BIBLIOGRAPHY: F. J. A. Hort, *Two Dissertations*; G. D. W. Ommanney, *Critical Dissertation on the Athanasian Creed*; J. A. Robinson, *The Athanasian Creed*; E. C. S. Gibson, *The Three Creeds*; R. O. P. Taylor, *Athanasian Creed in the Twentieth Century*.

**ATHANA'SIUS, ST.** Archbishop of Alexandria, a renowned father of the Church, born in that city about A.D. 296, died 373. While yet a young man he attended the Council at Nice (325), where he gained the highest esteem of the fathers by the talents which he displayed in the Arian controversy. He had a great share in the decrees passed here, and thereby drew on himself the hatred of the Arians. Shortly afterwards he was appointed Archbishop of Alexandria. The complaints and accusations of his enemies at length induced the Emperor Constantine to summon him in 334 before the Councils of Tyre and Jerusalem, when he was suspended, and afterwards banished to Trèves. The death of Constantine put an end to this banishment, and Constantius recalled the holy patriarch. His return to Alexandria resembled a triumph. Deposed again in 340, he was reinstated in 342. Again in 355 he was sentenced to be banished, when he retired into those parts of the desert which were entirely uninhabited. He was followed by a faithful servant, who, at the risk of his life, supplied him with the means of subsistence. Here Athanasius composed many writings, full of eloquence, to strengthen the faith of the believers, or expose the falsehood of his enemies.

When Julian the Apostate ascended the throne, toleration was proclaimed to all religions, and Athanasius returned to his former

position at Alexandria. His next controversy was with the heathen subjects of Julian, who excited the emperor against him, and he was obliged to flee in order to save his life. The death of the emperor and the accession of Jovian (363) again brought him back; but Valens becoming emperor, and the Arians recovering the superiority, he was once more compelled to flee. He concealed himself in the tomb of his father, where he remained four months, until Valens allowed him to return. From this period he remained undisturbed in his office till he died. Of the forty-six years of his official life he spent twenty in banishment, and the greater part of the remainder in defending the Nicene Creed. Athanasius was not so much a speculative theologian as a great Christian pastor (cf. L. Duchesne, *Histoire ancienne de l'Église*, 1907). His writings, which are in Greek, are on polemical, historical, and moral subjects. The polemical treat chiefly of the doctrines of the Trinity, the incarnation of Christ, and the divinity of the Holy Spirit. The historical ones are of the greatest importance for the history of the Church. *See* ATHANASIAN CREED.

**A'THEISM** (Gr. *a*, priv., and *Theos*, God). The disbelief of the existence of a God or supreme intelligent being; the doctrine opposed to *theism* or *deism*. The term has been often loosely used as equivalent with *infidelity* generally, with deism, with pantheism, and with the denial of immortality. The most famous exponents of atheism were La Mettrie, Holbach, Feuerbach, and Carl Vogt; whilst Comte and Haeckel have put forward systems of thought essentially atheistic.—BIBLIOGRAPHY: R. Flint, *Anti-theistic Theories*; J. S. Blackie, *Natural History of Atheism*; F. A. Lange, *History of Materialism*.

**ATH'ELING.** A title of honour among the Anglo-Saxons, meaning one who is of noble blood. The title was gradually confined to the princes of the blood royal, and in the ninth and tenth centuries was used exclusively for the sons or brothers of the reigning king.

**ATHELING, Edgar.** *See* EDGAR ATHELING.

**ATH'ELNEY.** Formerly an island in the midst of fens and marshes, now drained and cultivated, in Somersetshire, England, about 7 miles south-east of Bridgwater. Alfred the Great took refuge in it during a Danish invasion, and afterwards founded an abbey there.

**ATH'ELSTAN.** King of England, born 895, died 941, succeeded his father, Edward the Elder, in 925. He was victorious in his wars with the Danes of Northumberland, and the Scots, by whom they were assisted. After a signal overthrow of his enemies at Brunanburgh he governed in peace and with great ability.

**ATHÊ'NA, or ATHÉNÊ.** A Greek goddess, identified by the Romans with Minerva, the representative of the intellectual powers; the daughter of Zeus (Jupiter) and Mêtis (that is, wisdom or cleverness). According to the legend, before her birth Zeus swallowed her mother, and Athena afterwards sprang from the head of Zeus with a mighty war shout and in complete armour. In her character of a wise and prudent warrior she was contrasted with the fierce Ares (Mars). In the wars of the giants she slew Pallas and Enceladus. In the wars of the mortals she aided and protected heroes. She is also represented as the patroness of the arts of peace. The sculptor, the architect, and the painter, as well as the philosopher, the orator, and the poet, considered her their tutelar deity. She is also represented among the healing gods. In all these representations she is the symbol of the thinking faculty, the goddess of wisdom, science, and art; the latter, however, only in so far as invention and thought are comprehended.

In the images of the goddess a manly gravity and an air of reflection are united with female beauty in her features. As a warrior she is represented completely armed, her head covered with a gold helmet. As the goddess of peaceful art she appears in the dress of a Grecian matron. To her insignia belong the Ægis, the Gorgon's head, the round Argive buckler; and the owl, the cock, the serpent, an olive branch, and a lance were sacred to her. All Attica, but particularly Athens, was sacred to her, and she had numerous temples there. Her most brilliant festival at Athens was the Panathenæa.

**ATHENÆ'UM.** The temple of Athena or Minerva, at Athens, frequented by poets, learned men, and orators. The same name was given at Rome to the school which Hadrian established on the Capitoline Mount for the promotion of literary and scientific studies. In modern times the same name is given to literary clubs and establishments connected with the sciences. It is also the title of several literary periodicals.

**ATHENÆ'US.** A Greek rhetorician and grammarian, who lived at

the end of the second and beginning of the third century after Christ, author of an encyclopædic work, in the form of conversation, called *The Professors at the Dinner-table* (*Deipnosophistæ*), which is a rich but ill-arranged treasure of historical, antiquarian, philosophical, grammatical, etc., knowledge.

**ATHENAG'ORAS.** A Platonic philosopher of Athens, a convert to Christianity, who wrote a Greek *Apology for the Christians*, addressed to the Emperor Marcus Aurelius, in 177, one of the earliest that appeared.

**ATH'ENS** (Gr. *Athēnai*, Lat. *Athēnæ*). Anciently the capital of Attica and centre of Greek culture, now the capital of the republic of Greece. It is situated in the central plain of Attica, about 4 miles from the Saronic Gulf or Gulf of Ægina, an arm of the Ægean Sea running in between the mainland the Peloponnesus. It is said to have been founded about 1550 B.C. by Cecrops, the mythical Pelasgian hero, and to have borne the name Cecropia until under Erechtheus it received the name of Athens in honour of Athēnē. The Acropolis, an irregular oval crag 150 feet high, with a level summit 1000 feet long by 500 in breadth, was the original nucleus of the city, which, according to tradition, was extended by Theseus when Athens became the head of the confederate Attic States. The three chief eminences near the Acropolis—the Areopagus to the north-west, the Pnyx to the south-west, and the Museum to the south of the Pnyx—were thus included within the city boundary as the sites of its chief public buildings, the city itself, however, afterwards taking a northerly direction. On the east ran the Ilissus and on the west the Cephissus, while to the south-west lay three harbours—Phalerum, the oldest and nearest; The Piræus, the most important; and Munychia, the Piræan Acropolis. At the height of its prosperity the city was connected with its harbours by three massive walls (the "long walls").

**Architectural development.** The architectural development of Athens may be dated from the rule of the Pisistratids (560-510 B.C.), who are credited with the foundation of the huge temple of the Olympian Zeus, completed by Hadrian seven centuries later, the erection of the Pythium or temple of the Pythian Apollo, and of the Lyceum or temple of Apollo Lyceus—all near the Ilissus; and to whom were due the enclosure of the Academy, a gymnasium and gardens to the north of the city, and the building of the Agora with its Portico or Stoa, Bouleuterium or Senate-house, Tholus, and Prytaneum. With the foundation of Athenian democracy under Clisthenes, the Pnyx or place of public assembly, with its semicircular area and cyclopean wall, first became of importance, and a commencement was made of the Dionysiac theatre (theatre of Dionysus or Bacchus) on the south side of the Acropolis.

After the destruction wrought by the Persians in 480 B.C., Themistocles reconstructed the city upon practical lines and with a larger area, enclosing the city in new walls 7½ miles in circumference, erecting the north wall of the Acropolis, and developing the maritime resources of the Piræus; while Cimon added to the southern fortifications of the Acropolis, placed on it the temple of Wingless Victory, planted the Agora with trees, laid out the Academy, and built the Theseum on an eminence north of the Areopagus; his brother-in-law, Peisianax, erected the famous Stoa Poecilē, a hall with walls covered with paintings (whence the *Stoics* got their name).

Under Pericles the highest point of artistic development was reached. An Odeum was erected on the east of the Dionysiac theatre for the recitations of rhapsodists and musicains; and with the aid of the architects Ictinus, Callicrates, and Mnesicles, and of the sculptor Phidias, the Acropolis was perfected. Covering the whole of the western end rose the Propylæa, the splendid structure through which the Acropolis was entered, constructed of Pentelic marble and consisting of a central gateway portico with two wings in the form of Doric temples.

The Parthenon, Athens

Just outside the Propylæa was the small temple of Wingless Victory. A short distance within the entrance stood the bronze statue of Athena Promachus, a colossal work of Phidias, 66 feet high, showing the goddess in complete armour and leaning on a lance. Beyond it to the left was the Erechtheum, the shrine of Athena Polias, guardian of the city, containing a very ancient and sacred statue of Athena in olive-wood; while to the right, on the

highest part of the Acropolis, was the marble Parthenon or temple of Athena, the crowning glory of the whole. This renowned structure, still glorious in its ruins, was built under the auspices of Pericles, Phidias being the sculptor and artistic adviser, and Ictinus and Callicrates the architects. It is in the Doric style, and among its numerous sculptures were fifty life-size statues, while in the interior was a chryselephantine (gold and ivory) figure of the goddess, 39 feet high. (*See* PARTHENON). Minor statues and shrines occupied the rest of the area of the Acropolis, which was for the time wholly appropriated to the worship of the guardian deities of the city. The Acropolis museum, a building of recent date, contains an interesting and valuable collection of works of art found here.

In the interval between the close of the Peloponnesian War and the battle of Chæronea few additions were made to the city. But the long walls and Pirœus, destroyed by Lysander, were restored by Conon, and under the orator Lycurgus the Dionysiac temple was completed, the Panathenaic stadium commenced, and the choragic monuments of Lysicrates and Thrasyllus erected. Later on Ptolemy Philadelphus gave Athens the Ptolemæum near the Theseum, Attalus I. the stoa north-east of the Agora, Eumenes II. that near the great theatre, and Antiochus Epiphanes carried on the Olympieum.

Under the Romans it continued a flourishing city, Hadrian in the second century adorning it with many new buildings, and constructing an aqueduct, finished by his son Antonious Pius. At this time also a wealthy citizen, Herodes Atticus, did much to beautify the city, and in particular constructed an Odeum, the ruins of which are still conspicuous. Indeed Athens was at no time more splendid than under the Antonines, when Pausanias visited and described it. But after a time Christian zeal, the attacks of barbarians, and robberies of collectors made sad inroads among the monuments.

About A.D. 420 paganism was totally annihilated at Athens, and when Justinian closed even the schools of the philosophers, the reverence for buildings associated with the names of the ancient deities and heroes was lost. The Parthenon was turned into a church of the Virgin Mary, and St. George stepped into the place of Thesues. Finally, in 1456, the place fell into the hands of the Turks. The Parthenon became a mosque, and in 1687 was greatly damaged by an explosion at the siege of Athens by the Venetians. Enough, however, remains of it and of the neighbouring structures to attest the splendour of the Acropolis; while of the other buildings of the city, the Theseum, or temple of Theseus, and the Horologium, or temple of the Winds, are admirably preserved, as are also structures belonging to the Pnyx, Panathenaic stadium (restored and again used for games), etc. The Theseum, indeed, is said to be the best preserved building of all ancient Greece, and is hardly less imposing than the Parthenon. Of more than a hundred columns that belonged to the Olympieum or temple of the Olympian Zeus, completed by Hadrian, only fifteen are still standing.

Soon after the commencement of the war of liberation in 1821 the Turks surrendered Athens, but captured it again in 1826-7. The Great Powers now intervened to bring about the independence of Greece. The Turks evacuated Athens in 1833, and the troops of King Otho then entered the city. In 1835 it became the royal residence, and it soon began to make rapid progress, though its natural position is by no means advantageous.

The modern city mostly lies north, north-east, and north-west of the Acropolis, and consists mainly of straight and well-built streets. Among the principal buildings are the royal palace, a stately building with a façade of Pentelic marble (completed 1843), the university, the academy of science, national museum of archæology, public library, exhibition building, polytechnic institute, theatre, and observatory. There are two universities, the National University, opened in 1836, and the Capodistrian University with 3250 students. There are valuable museums, in particular the National Museum and that in the Polytechnic School, which contains the Schliemann collection, etc. These are constantly being added to by excavations. There are four foreign archæological schools or institutes, the French, German, American, and British. The Zappeion or exhibition building is a handsome structure, erected at the expense of the brothers Zappas to exhibit Greek industries. Tramways have been made in the principal streets, and the city is connected by tramway and railway (6 miles) with its port, the Pirœus. Athens has also railway connection with the north and west of the kingdom as well as with the Peloponnesus. The Pirœus is the chief Greek centre of trade and industry. Water is brought from Mount Pente-

licus on the north-east, the aqueduct begun by Hadrian being utilized in supplying the city. Pop. 292,991, and including the Piræus 426,473.—BIBLIOGRAPHY: E. A. Gardner, *Ancient Athens*; J. E. Harrison, *Mythology* and *Monuments of Ancient Athens*; W. Warde Fowler, *The City-State*, chapter vi.; W. M. Leake, *Topography of Athens and the Demi*; C. H. Weller, *Athens and its Monuments*.

**ATHENS.** The name of many places in the United States, the chief being in Georgia, and containing the Georgia University and the State college of agriculture. It carries on the cotton manufacture, has manufactures of agricultural implements, etc., and is a centre of trade. It was founded in 1801. Pop. 14,913.

**ATH'ERINE** (*Atherina*). The name of a genus of small fishes abundant in the Mediterranean and caught in British waters, especially on the coasts of the south of England, some of them being highly esteemed as food. They are also known as *Sand-smelts*. There are two British species.

**ATHERO'MA.** In pathology, a term applied to a change that may take place in the inner coat of an artery, consisting in a kind of fatty degeneration, leading to an aneurism or bursting. Also an encysted tumour containing matter of a curdy appearance.

**ATH'ERSTONE.** A town in Warwickshire, England, 8 miles S.E. of Tamworth, and equidistant (100 miles) from London, Liverpool, and Lincoln. It has manufactures of hats, and is the reputed birthplace of the poet Drayton. Pop. (1931), 21,736 (rural district).

**ATH'ERTON.** Town of England, Lancashire, 13 miles north-west of Manchester; cotton-factories, collieries, and ironworks give chief employment to the inhabitants. Pop. (1931), 19,985.

**ATHLETES** (ath'lēts; Gr. *athlētai*, from *athlos*, a contest, *athlon*, a prize). Originally, in ancient Greece, combatants who took part and contended for a prize (*athlon*) in the public games. The profession was an honourable one; tests of birth, position, and character were imposed, and crowns, statues, special privileges, and pensions were among the rewards of success. (*See* GAMES). The word is used in a similar sense at the present day, but is more especially applied to persons who can exhibit feats of strength. Games and athletic competitions, if they do not hold such an honourable position to-day as they did in antiquity, are still practised with great enthusiasm and excite the keenest interest in their patrons.

**ATHLETIC SPORTS.** A general name for certain physical exercises demanding a special natural ability, and embodying a variety of events which conventionally include not only running and jumping but such feats of strength as putting the weight and throwing the hammer. The selection of these events at any athletic meeting is a somewhat arbitrary one, and the inclusion of those which require strength and skill rather than speed and agility rests more on a traditional than a logical basis. A particular feature which distinguishes these exercises as athletic sports is the presence of the idea of competition; thus running and walking, as isolated exercises, can be called "sports" only when men compete against one another, although the factor of competition may be only indirectly present, as when an athlete endeavours to beat a record.

In this country athletic sports have long been a national characteristic, and records, more or less authentic, have been handed down for the last hundred years or more. Until comparatively recently, such sports have been the prerogative of the British Isles; but during the last thirty years the United States have adopted them with enormous enthusiasm and success, and more recently still the vogue has extended throughout the Continent, and good results have been obtained by representatives from France, Germany, Italy, Austria, Sweden, and Finland, as well as from all the Colonies. In this country no school, no matter how small or how humble its pretensions, fails to hold its athletic meeting annually. The same applies to all colleges of the leading universities, Oxford and Cambridge, the best representatives of which compete against one another, whilst the smaller universities hold similar competitions.

In addition, a large number of clubs are in existence throughout the country for the promotion and encouragement of sports, the whole system of athletics being under the Amateur Athletic Association (founded in 1880), whose rules and regulations for the correct maintenance of athletics in the best interests of amateurism are regarded as a standard throughout the world. Under its auspices an annual meeting—the Amateur Championships—is held. This meeting is open to the whole world, and many of the championships

have been held at one time or another by distinguished visitors from America, the Colonies, and the Continent. At the time of writing, the association is considering the project of holding two distinct annual meetings, one of which shall, as hitherto, be unrestricted, the other confined to residents in the British Isles. This, which is the most important meeting of the year, has taken place uninterruptedly since its origin in 1866 with the exception of the military interval, 1915-8. It was, however, successfully resumed in 1919. For a considerable number of years the meeting has been held in London on the first Saturday in July, and this practice will probably be a permanent one, although hitherto the venue was, in rotation, London, the Midlands, and the North.

The university and inter-university meetings are held before Easter, the former at the respective university towns, the latter at Queen's Club, London. Among other important representative contests may be mentioned the Public Schools' Championships (usually in April), the United Hospitals' Championships, the Irish, the Scottish, the Welsh, the Midland and the Northern Counties' Championships. During the war, athletics were practically restricted to the services, and the Army Athletic Championships, held in Aug., 1919, was a successful reunion of soldier athletes from the various theatres of war, and included, for the first time in history, coloured troops.

The standard inter-university meeting comprises ten events, namely, flat races—100 yards, ¼ mile, ½ mile, 1 mile, and 3 miles; 120-yards hurdle race; the high jump and long jump; putting the weight and throwing the hammer. These events appear in the programme of the Amateur Championship meeting, with the substitution of a 4-miles race for the 3 miles, and the addition of a 220-yards race, a 2-miles walking race, a 2-miles steeplechase (representing a miniature cross-country event), and the pole jump. A relay race, in which four representatives from each club run half a mile, a quarter of a mile, 220 yards, and 220 yards respectively, is also included as a standard event; whilst at the 1919 meeting a race for 440 yards over hurdles appeared for the first time, and will probably occupy a permanent place in the programme. Two additional Amateur Championship events, 7-miles walk and 10-miles flat race, are usually held at a separate meeting in the spring.

In addition to the preceding British meetings, a great International contest, the Olympic Games, is held every four years in a country selected by the Olympic committee. This meeting is truly international, the last before 1914 having taken place at Stockholm in 1912, when representatives from the most distant parts of the world competed with representatives from every country in Europe in a remarkably elaborate programme, which included, in addition to the preceding, such feats as throwing the javelin and the discus, and the classic "Marathon race" over the traditional distance of 26½ miles. The 1932 Olympic meeting was held at Los Angeles and attracted widespread interest.

Although many excellently arranged atheltic sports are held successfully upon a grass course, at any important meeting the races are contested upon a properly-constructed cinder-path, a quarter or a third of a mile in length, and in shape an oval flattened on two sides so as to include as much straight as possible. The width of the running path is variable, but 18 to 24 feet may be regarded as an average. The centre is of grass, and spaces are prepared for the hurdle race, for the jumps, and the other events which are described as the field, as opposed to *track* events.

Flat races are classified as "sprint races," "middle distance" and "long distance" races, although the distinction between these is somewhat arbitrary. Whether or no a man is actually capable of running the whole distance in question at full speed, the term "sprint" is applied to those distances in which an attempt is made to put forth a continuous maximum effort. The limit is, by general consent, fixed at 300 yards. At any good meeting the 100-yards race will be run in 10 seconds; at the very best meeting this time will be beaten; and many runners have been credited with 9¼ seconds, a few, under exceptional conditions, with 9⅜ seconds. The record for 220 yards is 20⅜ seconds. Middle-distance running includes races from a quarter mile to a mile, and races are held at 440 yards, 600 yards, 880 yards. 1000 yards, 1 mile, and very occasionally at ¾ mile. With modern specialization, however, it is rare to find any one runner capable of supremacy at more than one of these distances. The ¼-mile is the common ground for the sprinter and the middle-distance runner, and 48 seconds has been beaten on several occasions, although it may be said that anything inside 50 seconds is a first-class performance. The record

for 600 yards is 1 minute 10⅘ seconds. The ¼-mile race has demonstrated latterly, perhaps, the greatest advance of all; and whilst anything under 2 minutes may still be regarded as a good performance, a championship event will most always be won in 3 or 4 seconds faster time; whilst the established record is the wonderful time of 1 minute 51⅘ seconds. The mile, which was originally regarded as a long-distance event, is now legitimately considered as within the capacity of a middle-distance runner. At any first-class meeting 4 minutes 20 seconds will be accomplished, and any diminution of this time may be regarded as of superlative merit. The record, which has stood since 1931, is 4 minutes 9¼ seconds. This was made by a French runner, J. Ladoumegue, and is the official world's record. Over 1 mile, long-distance running begins, and, as considerable staying-power is required, it is not unusual to find one man prove champion at 4 miles and 10 miles, and even the 1-mile race in the same year. No runner has yet achieved the capacity of running 12 miles within the hour, although two or three have been within a few hundred yards of this distance.

About ten years ago the fashion became a craze of contesting "Marathon races," in which all sorts of distances, quite independent of the classic 26¾ miles, were employed. At rare intervals, very long-distance running, such as 50 miles, is indulged in. For any distance over 20 miles a special form of endurance is called for, rather than orthodox running in good style. As a competition "walking" is an unsatisfactory exercise, because of the extreme difficulty in deciding when the athlete is still fulfilling the orthodox regulation as to what constitutes fair "heel and toe," inasmuch as the style of a man who is ostensibly walking, yet actually progressing at a rate faster than 9 miles an hour (faster than the average untrained person can run), is exceedingly difficult to analyse. About fifteen years ago long-distance walking became exceedingly popular, and hundreds of competitors attempted the classic walk to Brighton and back.

The usual hurdle race is over 120 yards, with ten flights of hurdles 10 yards apart, so that a distance of 15 yards separates the start from the first flight, and the same distance the last flight from the finish. The hurdles are 3½ feet high, with perfectly-level top rails. In correct "hurdling" the "three-stride method" is essential, that is to say, three strides are taken on the flat between the hurdles, and the athlete rises 6 feet from the obstacle, taking it in his stride, so that retardation of speed is reduced to a minimum. The skill and accuracy of an accomplished hurdler is remarkable, and the race is frequently run inside 16 seconds; a record of 14¼ seconds has been accomplished. The record for the 440 yards hurdle race is 52⅘ sec.

In this country, running long jump and high jump (and to a less extent the pole jump) alone are practised to any extent, although as occasional events the standing high and long jumps are contested, and, still less frequently, the old-fashioned hop, step, and jump. In the long jump the athlete employs all the impetus he can acquire by a sprint of about 30 yards. The ideal aimed at is to run at the fastest speed which is consistent with reaching the taking-off board with accuracy, and then to leap as high as possible. A fraction of an inch under 25 feet has been cleared on two occasions, and the record, established in 1931, is 26 feet 2¼ inches. It may be said that any jumper capable of 23 feet consistently has a good chance to win an Amateur Championship. The high jump requires skill of a very peculiar character. Whilst the novice regards this feat as dependent on momentum, and takes a correspondingly long run to acquire speed, the crack peformer employs his capacity of manipulating his body and limbs so as to cross the bar in a horizontal position. In this way the prodigious height of 6 feet 8¾ inches has been cleared. In general it may be said that first-class jumping begins at 6 feet.

Pole jumping, a particularly pretty event to watch, has never been practised to any great extent in this country, and, in fact, does not even appear to be so popular here as twenty years ago. The pole employed is of light but strong bamboo about 14 feet long, with a sharp ferrule at one end, which is stuck firmly into the ground. By the help of the pole, which is firmly grasped near the other end, the jumper elevates himself to the bar, over which he throws his legs and his body, finally relinquishing his hold of the pole, to fall on the opposite side. Recent years have witnessed the development of great skill in this event, particularly by the Americans, Canadians, and Swedes, and 14 feet has been cleared.

The weight or shot is an iron ball weighing 16 lb., which must be put with one hand only from the shoulder within a circle of 7 feet diameter. Although great strength is essential, skill in utilizing the whole of the

body plays a very important part. Over 52 feet has been put on several occasions.

The "hammer" is a ball of lead or iron attached by a wire to a handle. The total length must not exceed four feet; the weight of the whole must be at least 16 lb. The performer grasps the handle with one or both hands, and, standing within a 7-foot circle, swings the ball round and round to acquire impetus, which is then increased by rapid rotatory movements of his body. Once again skill and co-ordination must be wedded to strength. A crack performer has thrown 189 feet 6½ inches.

Throwing the javelin and discus are classical rather than popular events, and their cultivation is fashionable only when an Olympic contest is imminent. Among other "strong-men" contests, which have long been favourite sports in Scotland, are tossing the *caber* and putting the stone. The latter is usually a very heavy implement weighing about 56 lb.; the "caber" is the trunk of a fir or other tree, freed from branches, which is held upright close to the chest by the smaller end, and thrown so as to alight on the heavier end.—BIBLIOGRAPHY: *Encyclopædia of Sports and Games*; *Annual Sporting and Athletic Register*; F. A. M. Webster, *The Evolution of the Olympic Games*, 1829 B.C.—A.D. 1914; G. Le Roy, *Athlétisme*; E. W. Hjertberg, *Athletics in Theory and Practice*; P. Withington, *The Book of Athletics*.

**ATHLONE'**. A town of Ireland, divided by the Shannon into two parts, one in Westmeath, the other in Roscommon; about 76 miles west of Dublin. Its position has made it one of the chief military depots, and a centre of trade by river, canal, and railway. It manufactures woollen goods, linens, etc. Up to 1885 it sent one member to Parliament. Pop. (1926), 7546.

**ATHLONE, Earl of.** British title, borne from 1692 to 1844 by the family of Van Reede. A Dutch general who distinguished himself at the siege of Athlone was made the first earl in 1692. On the death of the 9th earl the title became extinct. In 1917 it was given to Alexander, Prince of Teck, a brother of Queen Mary. He married Alice, daughter of the Duke and Duchess of Albany. From 1923-30 he was Governor-General of South Africa. In 1932 he was elected Chancellor of the University of London. His eldest son is called Viscount Trematon.

**ATH'OLL**, or **ATHOLE.** A mountainous and romantic district in the north of Perthshire, Scotland, giving the title to a duke of the Murray family who owns a large area there.

**ATHOR, HATHOR,** or **HET-HER.** An Egyptian goddess, identified with Aphroditē or Venus. Her symbol was the cow bearing on its head the solar disc and hawk-feather plumes. Her chief temple was at Denderah. From her the third month of the Egyptian year derived its name.

**A'THOS** (now **HAGION OROS** or **MONTE SANTO,** that is, Holy Mountain). A mountain 6700 feet high, terminating the most eastern of the three peninsulas of Macedonia that jut in parallel directions into the Archipelago. The name, however, is frequently applied to the whole peninsula, which is about 30 miles long by 5 broad. It is covered with forests, and plantations of olive, vine, and other fruit-trees. Both the surface and coast-line are irregular. The Persian fleet under Mardonius was wrecked here in 493 B.C., and to avoid a similar calamity Xerxes caused a canal, of which traces may yet be seen, to be cut through the isthmus that joins the peninsula to the mainland.

On the peninsula there are situated about twenty monasteries and a multitude of hermitages, which contain from 6000 to 8000 monks and hermits of the order of St. Basil. The libraries of the monasteries are rich in literary treasures and manuscripts. Every nation belonging to the Greek Church has here one or more monasteries of its own, which are annually visited by pilgrims. After having passed in the fifteenth century from the sovereignty of the Greek Emperors of Byzantium to that of the Sultans, it fell again into the hands of the Greeks, who occupied it in Nov., 1912. Each of the twenty monasteries is a little republic in itself, and until 1912 they used to pay an annual tribute of nearly £4000 to the Turks, and were governed by a synod of twenty monastic deputies and four presidents meeting weekly. They are now ruled either by abbots chosen for life, or by a board of overseers elected for a certain number of years. The revenue of the community is derived from pilgrims, and from a considerable trade in amulets, rosaries, crucifixes, images, and wooden furniture.

**ATHY'**. A town in Ireland, county of Kildare, 37 miles south-west of Dublin, on the Barrow, which is here joined by the Grand Canal. Its

chief trade is in corn. Pop. (1926), 3459.

**ATIT'LAN.** A lake and mountain of Central America in Guatemala. The lake is about 24 miles long and 10 broad; the mountain is an active volcano 12,160 feet high.

**ATLAN'TA.** A city in the United States, capital of Georgia, on an elevated ridge, 7 miles south-east of the Chattahoochee River. It is an important railway centre; carries on a large trade in grain, paper, cotton, flour, and especially tobacco, and possesses flour-mills, paper-mills, ironworks, etc. Here are Atlanta University for negro men and women, a theological college, a medical college, etc. Atlanta suffered severely during the Civil War, and a battle was fought there on 22nd July, 1864. A fire which broke out on 21st May, 1917, caused damage estimated at more than £1,000,000. Pop. (1920), 200,600.

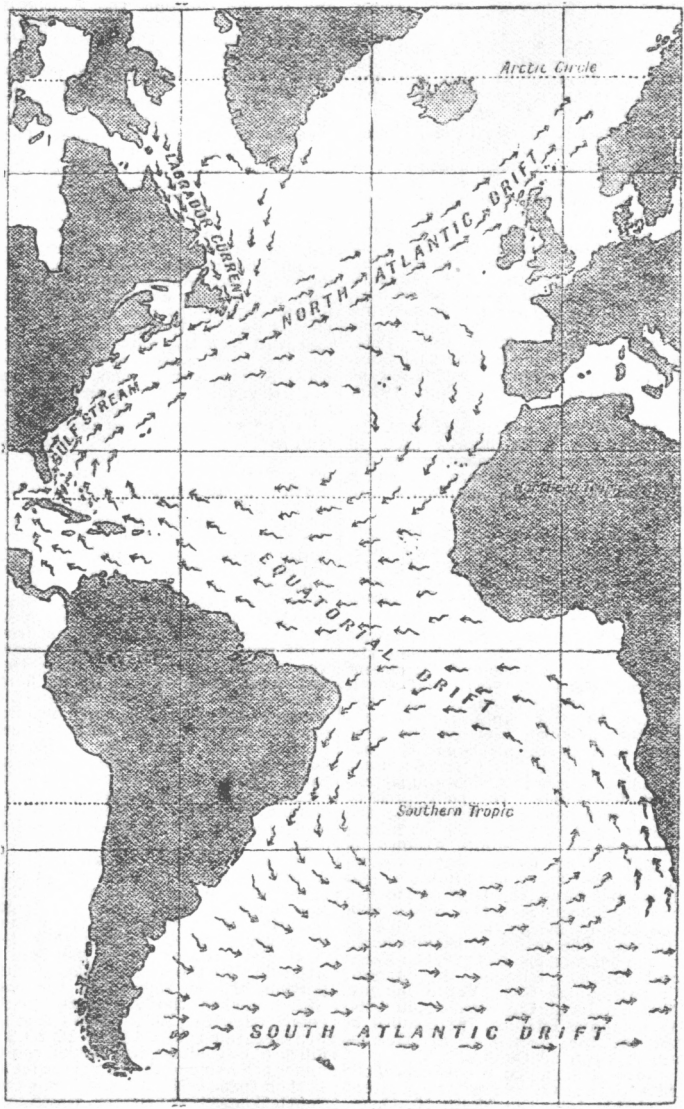
**ATLAN'TES,** or **TELAMÕNES.** In architecture, male figures used in place of columns or pilasters for the support of an entablature or cornice. Female figures so employed are termed *caryatides*.

**ATLANTIC CITY.** A fashionable watering-place of the United States, on the coast of New Jersey. It is an important air port, and has an aerodrome covering about 160 acres. Pop. 50,682.

**ATLANTIC OCEAN.** The vast expanse of sea lying between the west coasts of Europe and Africa and the east coasts of North and South America, and extending from the Arctic to the Antarctic Ocean; greatest breadth, between the west coast of Northern Africa and the east coast of Florida, 4150 miles; least breadth, between Norway and Greenland, 930 miles. The total area of the North Atlantic (including the inland seas) is 13,262,000 sq. miles; the area of the South Atlantic is 12,627,000 sq. miles. The principal inlets and bays are Baffin's and Hudson's Bays, the Gulf of Mexico, the Caribbean Sea, the North Sea, the Bay of Biscay, and the Gulf of Guinea. The principal islands north of the equator are Iceland, the Faroe and British Islands, the Azores, Canaries, and Cape Verde Islands, Newfoundland, Cape Breton, and the West India Islands; and south of the equator, Ascension, St. Helena, and Tristan da Cunha.

**Currents.** The great currents of the Atlantic are the Equatorial Current (divisible into the Main, Northern, and Southern Equatorial Currents), the Gulf Stream, the North African and Guinea Current, the Southern Connecting Current, the Southern Atlantic Current, the Cape Horn Current, Rennel's Current, and the Arctic Current. The current system is primarily set in motion by the trade-winds which drive the water of the intertropical region from Africa towards the American coasts. The Main Equatorial Current, passing across the Atlantic, is turned by the S. American coast, along which it runs at a rate of 30 to 50 miles a day, till, having received part of the North Equatorial Current, it enters the Gulf of Mexico. Issuing thence between Florida and Cuba under the name of the Gulf Stream, it flows with a gradually-expanding channel nearly parallel to the coast of the United States. It then turns north-eastward into the mid-Atlantic, the larger proportion of it passing southward to the east of the Azores to swell the North African and Guinea Current created by the northerly winds off the Portuguese coast. The Guinea Current, which takes a southerly course, is divided into two on arriving at the region of the north-east trades, part of it flowing east to the Bight of Biafra and joining the South African feeder of the Main Equatorial, but the larger portion being carried westward into the North Equatorial drift. Rennel's Current, which is possibly a continuation of the Gulf Stream, enters the Bay of Biscay from the west, curves round its coast, and then turns north-west towards Cape Clear. The Arctic Current runs along the east coast of Greenland (being here called the Greenland Current), doubles Cape Farewell, and flows up towards Davis' Strait; it then turns to the south along the coasts of Labrador and the United States, from which it separates the Gulf Stream by a cold band of water. Immense masses of ice are borne south by this current from the Polar seas.

In the interior of the North Atlantic there is a large area comparatively free from currents, called the Sargasso Sea, from the large quantity of sea-weed (of the genus Sargassum) which drifts into it. A similar area exists in the South Atlantic. In the South Atlantic the portion of the Equatorial Current which strikes the American coast below Cape St. Roque flows southward at the rate of from 12 to 20 miles a day along the Brazil coast under the name of the Brazil Current. It then turns eastward and forms the South Connecting Current, which, on reaching the South African coast, turns northward into the Main and




CURRENTS OF THE ATLANTIC OCEAN

Southern Equatorial Currents. Besides the surface currents, an under current of cold water flows from the poles to the equator, and an upper current of warm water from the equator towards the poles.

**Depth.** The greatest depth as yet discovered is north of Porto Rico, in the West Indies, namely 27,360 feet. Cross-sections of the North Atlantic between Europe and America show that its bed consists of two great valleys lying in a north-and-south direction, and separated by a ridge, on which there is an average depth of 1800 fathoms. The mean depth of the North Atlantic is 2047 fathoms, that of the South Atlantic 2067 fathoms. A ridge, called the *Wyville-Thomson Ridge*, with a depth of little more than 200 fathoms above it, runs from near the Butt of Lewis to Iceland, cutting off the colder water of the Arctic Ocean from the warmer water of the Atlantic. The South Atlantic, of which the greatest depth yet found is over 3000 fathoms, resembles the North Atlantic in having an elevated plateau or ridge in the centre with a deep trough on either side. The saltness and specific gravity of the Atlantic gradually diminish from the tropics to the poles, and also from within a short distance of the tropics to the equator. In the neighbourhood of the British Isles the salt has been stated at one thirty-eighth of the weight of the water. The North Atlantic is the greatest highway of ocean traffic in the world. It is also a great area of submarine communication, by means of the telegraphic cables that are laid across its bed. *See* OCEANOGRAPHY.

**ATLANTIC TELEGRAPH.** *See* TELEGRAPH.

**ATLAN'TIDES** (-dēz). A name given to the Pleiades, which were fabled to be the seven daughters of Atlas or of his brother Hesperus.

**ATLAN'TIS.** An island which, according to Plato, existed in the Atlantic over against the Pillars of Hercules (Straits of Gibraltar), was the home of a great nation, and was finally swallowed up by the sea. The legend has been accepted by some as fundamentally true; but others have regarded it as the outgrowth of some early discovery of the New World.

**ATLAN'TOSAURUS.** A gigantic fossil reptile, ord. Dinosauria, obtained in the upper Jurassic strata of the Rocky Mountains, attaining a length of 110 feet or more.

**ATLAS.** An extensive mountain system in North Africa, starting near Cape Nun on the Atlantic Ocean, traversing Morocco, Algiers, and Tunis, and terminating on the coast of the Mediterranean; divided generally into two parallel ranges, running W. to E., the Greater Atlas lying towards the Sahara and the Lesser Atlas towards the Mediterranean. The principal chain is about 1500 miles long, and the principal peaks rise above or approach the line of perpetual congelation, Miltsin in Morocco being 11,400 feet high, and Tizi Likumpt being 13,150. The highest elevation is perhaps Tizi Tamyurt, estimated at fully 15,000 feet. Silver, antimony, lead, copper, iron, etc., are among the minerals. The vegetation is chiefly European in character, except on the low grounds and next the desert.

**ATLAS.** In Greek mythology, the name of a Titan whom Zeus condemned to bear the vault of heaven. —The same name is given to a collection of maps and charts, and was first used by Gerard Mercator in the sixteenth century, the figure of Atlas bearing the globe being given on the title-pages of such works.

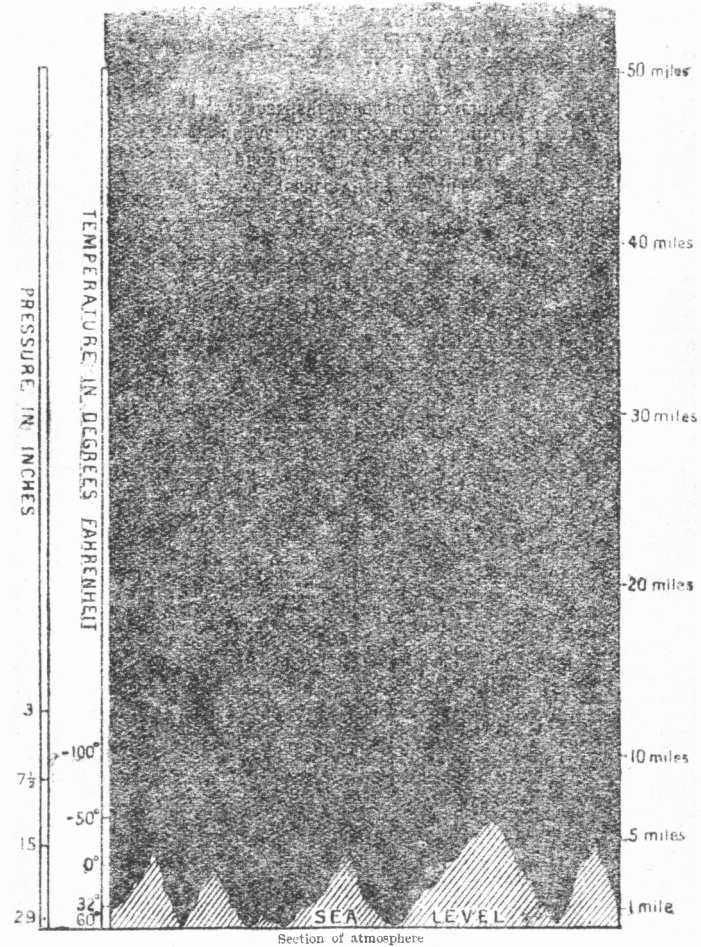
**ATLAS.** In anatomy, is the name of the first vertebra of the neck, which supports the head. It is connected with the occipital bone in such a way as to permit of the nodding movement of the head, and rests on the second vertebra or *axis*, their union allowing the head to turn from side to side.

**AT'LAS.** A kind of silk or silk-satin fabric of Eastern manufacture.

**ATMIDOM'ETER.** An instrument for measuring the evaporation from water, ice, or snow. It somewhat resembles Nicholson's hydrometer, being constructed so as to float in water and having an upright graduated stem, on the top of which is a metal pan. Water, ice, or snow is put into the pan, so as to sink the zero of the stem to a level with the cover of the vessel, and as evaporation goes on the stem rises, showing the amount of evaporation in grains.

**ATMOM'ETER.** An instrument for measuring the amount of evaporation from a moist surface in a given time. It is often a thin hollow ball of porous earthenware in which is inserted a graduated glass tube. The cavity of the ball and tube being filled with water and the top of the tube closed, the instrument is exposed to the free action of the air; the relative rapidity with which the water transuding through the porous substance is evaporated is marked by the scale on the tube as the water sinks.

**AT'MOSPHERE.** Primarily the gaseous envelope which surrounds the earth; but the term is applied to that of any orb. Twilight effects show that the atmosphere is sufficiently dense up to a height of 40 miles to scatter or reflect to an appreciable degree the sun's rays, while the phenomena of meteors, which are rendered luminous through friction, show that it extends, though in extremely attenuated form, to 100 or even 200 or more miles. It exerts on every part of the earth's surface a pressure of about 15 (14.73) lb. per sq. inch. The existence of this atmospheric pressure was first proved by Torricelli, who thus accounted for the rush of a liquid to fill a vacuum, and who, working out the idea, produced the first barometer. The average height of the mercurial column counterbalancing the atmospheric weight at the sea-level is a




Section of atmosphere

little less than 30 inches; but the pressure varies from hour to hour, and, roughly speaking, diminishes in geometrical progression with arithmetical increase in altitude. Of periodic variations there are two maxima of daily pressure, occurring when the temperature is about the mean of the day, and two minima, when it is at its highest and lowest respectively; but the problems of diurnal and seasonal oscillations have yet to be fully solved. The pressure upon the human body of average size is no less than 14 tons, but as it is exerted equally in all directions no inconvenience is caused by it. It is sometimes convenient to take the atmospheric pressure as a standard for measuring other fluid pressures; thus the steam pressure of 30 lb. per sq. inch on a boiler is spoken of as a pressure of two atmospheres.

The atmosphere, first subjected to analysis by Priestley and Scheele in the latter part of the eighteenth century, consists practically of oxygen and nitrogen in the almost constant proportion of 21 volumes of oxygen to 79 volumes of nitrogen, etc., or, by weight, 23 parts of oxygen to 77 of nitrogen, etc. The gases are associated together, not as a chemical compound, but as a mechanical mixture. Upon the oxygen present depends the power of the atmosphere to support combustion and respiration, the nitrogen acting as a diluent to prevent its too energetic action. It had long been known that atmospheric nitrogen appeared to have a very slightly greater density than nitrogen obtained from other sources. Lord Rayleigh and Sir William Ramsay found that the fact was due to a still more inert gas which forms nearly 1 per cent of the air, and which had not previously been separated from nitrogen. This has been named *argon*. Besides these gases, the atmosphere also contains aqueous vapour in variable quantity, ozone, carbonic acid gas, traces of ammonia, nitric acid, and, in towns, sulphuretted hydrogen and sulphurous acid gas. In addition to its gaseous constituents the atmosphere is charged with dust, bacteria, etc. For other gases which are present in traces, *see* NEON. *See* CLIMATE; METEOROLOGY.—BIBLIOGRAPHY: C. Flammarion, *L'Atmosphère*; Sir Napier Shaw, *The Weather Map*.

**ATMOSPHERIC ENGINE.** Name given by early inventors to engines in which the piston is restored to the bottom of its stroke by atmospheric pressure.

**ATMOSPHERIC RAILWAY.** So called in consequence of the motive power being derived from the pressure of the atmosphere, or from compressed air. The idea of thus obtaining motion was first suggested by the French engineer Papin, about 200 years ago. In 1810, and again in 1827, Medhurst published a scheme for "propelling carriages through a close-fitting air-tight tunnel by forcing in air behind them"; and in 1825 a similar project was patented by Vallance of Brighton.

About 1835 H. Pinkus, an American residing in England, patented a pneumatic railway. The carriages were to travel on an open line of rails, along which a cast-iron tube of between 3 and 4 feet diameter was to be laid, having a longitudinal slit from 1 to 2 inches wide and closed by a flexible valve along its upper side, through which a connection could be formed between the leading carriage and a piston working within the tube. This method was improved by Messrs. Clegg and Samuda, who in 1840 tried some experiments on a portion of the West London Railway with sufficient success to induce the Government to advance a loan to the Dublin and Kingstown Railway Company, for the construction of a pneumatic line from Kingstown to Dalkey. It was opened for passenger traffic at the end of 1843, and was worked for many months.

The London and Croydon Company subsequently obtained powers for laying down an atmospheric railway by the side of their other line from London to Croydon, and in experimental trips in 1845, a speed of 30 miles an hour was obtained with sixteen carriages, and of 70 miles with six carriages. But during the intense heat of the summer of 1846 the iron tube frequently became so hot as to melt the composition which sealed the valve, and the line had to be worked by locomotives. The mechanical difficulty of commanding a sufficient amount of rarefaction led to the abandonment of the system for railway purposes. It has been revived, however, for the conveyance of letters and parcels in towns by means of tubes of moderate diameter laid beneath the streets. *See* PNEUMATIC DISPATCH.

**ATOLL'.** The Polynesian name for coral islands of the ringed type enclosing a lagoon in the centre. They are found chiefly in the Pacific in archipelagos, and occasionally are of large size. Suadiva Atoll is 44 miles by 34; Rimsky 54 by 20. *See* CORAL.

**ATOMIC THEORY.** A theory as to the existence and properties of

atoms (*see* ATOMS); especially, in chemistry, the theory accounting for the fact that in compound bodies the elements combine in certain constant proportions, by assuming that all bodies are composed of ultimate atoms, the weight of which is different in different kinds of matter. It is associated with the name of Dalton, who systematized and extended the imperfect results of his predecessors.

On its practical side the atomic theory asserts three *Laws of Combining Proportions*: (1) The Law of Constant or Definite Proportions, teaching that in every chemical compound the nature and relative weights of the constituent elements are definite and invariable; thus water invariably consists of 8 parts by weight of oxygen to 1 part by weight of hydrogen; (2) The Law of Multiple Proportions, according to which the several proportions in which one element unites with a given weight of another invariably bear towards each other a simple relation; thus 1 part by weight of hydrogen unites with 8 parts by weight of oxygen to form water, and with 16 (i.e. $8 \times 2$) parts of oxygen to form peroxide of hydrogen; (3) The Law of Combination in Reciprocal Proportions, that the proportions in which two elements combine with a third also represent the proportions in which, or in some simple multiple of which, they will themselves combine; thus in olefiant gas hydrogen is present with carbon in the proportion of 1 to 6, and in carbonic-oxide, oxygen is present with carbon in the proportion of 8 to 6, 1 to 8 being also the proportions in which hydrogen and oxygen combine with each other. The theory that these *proportional numbers* are, in fact, nothing else but the relative weights of atoms so far accounts for the phenomena that the existence of these laws might have been predicted by the aid of the atomic hypothesis long before they were actually discovered by analysis. In themselves, however, the laws do not prove the theory of the existence of ultimate particles of matter of a certain relative weight; and although many chemists, even without expressly adopting the atomic theory itself, have followed Dalton in the use of the terms *atom* and *atomic weight*, in preference to *proportion*, *combining weight*, *equivalent*, and the like, yet in using the word *atom* it should be held in mind that it merely denotes the combining weights of the elements. These will remain the same whether the atomic hypothesis which suggested the employment of the term be true or false. Dalton supposed that the atoms are spherical, and invented certain symbols to represent the mode in which he conceived they might combine. The latest atomic hypothesis is one which assigns an electrical structure to the atom. *See* CHEMISTRY; ELECTRICITY; MATTER. Cf. H. E. Roscoe and A. Harden, *New View of Dalton's Atomic Theory*; Sir J. J. Thomson, *Atomic Theory*.

**ATOMIC WEIGHTS.** *See* CHEMISTRY; MOLECULAR WEIGHTS.

**ATOMISTS.** *See* ATOMS.

**ATOMS.** For many years regarded as the ultimate indivisible particles of the chemical elements. The idea originated with some of the ancient philosophers (the atomists), more especially Democritus (450 B.C.), Epicurus, and Lucretuis (99-55 B.C.), and was developed into a definite theory by Dalton (1804). According to Dalton the atoms of any one element are alike in all their properties, but differ from the atoms of other elements, and when chemical combination occurs it takes place between the atoms of the combining elements (*see* CHEMISTRY).

Various views have been held with regard to the nature of atoms. Newton regarded them as hard, ponderable particles, perfectly unalterable, and concluded that the difference between substances was due to different kinds of atoms. Lord Kelvin propounded the view that the properties of atoms might be explained by those of vortices or vortex rings in a homogeneous frictionless fluid. These speculations are now completely discredited. The view held at present is that the atom consists of a massive central nucleus of positive electricity, round which minute charges of negative electricity, called electrons, revolve at enormous speeds. *See* ELECTRON; ISOTOPES; MATTER, ATOMIC AND MOLECULAR THEORIES OF; NUMBER, ATOMIC; RADIOACTIVITY.

**ATONEMENT.** In Christian theology, the special work of Christ effected by His life, sufferings, and death. The first explicit exposition of the evangelical doctrine of the atonement is ascribed to Anselm, Archbishop of Canterbury, in 1093.

**ATRATO** (ä-trä'tō). A river of S. America, in the north-west of Colombia, emptying itself by nine mouths into the Gulf of Darien; it is navigable by steamers of some size for 250 miles, and has long been the subject of schemes for establishing water-communication between the Atlantic and Pacific.

**ATRAULI.** A town of India, United Provinces, Aligarh district, clean, well built, and with a good trade. Pop. 16,560.

**ATREB'ATES.** Ancient inhabitants of that part of Gallia Belgica, afterwards called *Artois*. A colony of them settled in Britain, in a part of Berkshire and Oxfordshire.

**AT'REK.** A river of Asia, forming the boundary between Persia and the Russian Transcaspian territory, and flowing into the Caspian; length 250 miles.

**ATREUS** (at'rūs). In Greek mythology, a son of Pelops and Hippodamia, and grandson of Tantalus. Atreus was the father of Agamemnon, according to Homer; other writers call him Agamemnon's grandfather. He succeeded Eurystheus, his father-in-law, as King of Mycēnæ, and in revenge for the seduction of his wife by his brother Thyestes gave a banquet at which the latter partook of the flesh of his own sons. Atreus was killed by Ægisthus, a son of Thyestes. The tragic events connected with this family furnished materials to some of the great Greek dramatists.

**ATRI** (ancient, **HADRIA**). An episcopal city in the province of Teramo, Italy, 8 miles from the Adriatic. It has an old (thirteenth century) Gothic cathedral, ruins of ancient Roman walls and buildings, and a palace of the Agraviva family, who were Dukes of Atri from 1398 to 1775. Pop. 14,043.

**AT'RIPLEX.** *See* ORACHE.

**A'TRIUM.** The entrance-hall and most important apartment of a Roman house, generally ornamented with statues, pictures, and *imagines* or ancestral likenesses, which were portrait masks in wax kept in cases. The *atrium* formed the reception-room for visitors and clients. It was lighted by the *compluvium*, an opening in the roof, towards which the roof sloped so as to throw the rainwater into a cistern in the floor called the *impluvium*.

In zoology the term is applied to the large chamber or "cloaca" into which the intestine opens in the Tunicata.

**AT'ROPA.** The nightshade genus of plants. *See* BELLADONNA.

**AT'ROPHY.** A wasting of the flesh due to some interference with the nutritive processes. It may arise from a variety of causes, such as permanent, oppressive, and exhausting passions, organic disease, a want of proper food or of pure air, suppurations in important organs, copious evacuations of blood, saliva, semen, etc., and it is also sometimes produced by poisons, for example arsenic, mercury, lead, in miners, painters, gilders, etc. In old age the whole frame except the heart undergoes atrophic change, and it is of frequent occurrence in infancy as a consequence of improper, unwholesome food, exposure to cold, damp, or impure air, etc. Single organs or parts of the body may be affected irrespective of the general state of nutrition; thus local atrophy may be superinduced by palsies, the pressure of tumours upon the nerves of the limbs, or by artificial pressure, as in the feet of Chinese ladies.

**AT'ROPIN,** or **AT'ROPINE.** A crystalline alkaloid obtained from the deadly nightshade (*Atrōpa Belladonna*). It is very poisonous, and produces persistent dilation of the pupil.

**AT'ROPOS.** The eldest of the three Fates (the others being Clotho and Lachēsis), who cuts the thread of life with her shears.

**ATTACHÉ** (at'a-shā). A junior member of the diplomatic services attached to an embassy or legation.

**ATTACH'MENT.** In English law, a taking of the person, goods, or estate by virtue of a writ or precept. It is distinguished from an *arrest* by proceeding out of a higher court by precept or writ, whereas the latter proceeds out of an inferior court by precept only. An arrest lies only against the body of a man, whereas an attachment lies often against the goods only, and sometimes against the body and goods. It differs from a *distress* in that an attachment does not extend to lands, while a distress cannot touch the body.—*Foreign attachment* answers to what in Scotland is termed arrestment, by means of which a creditor may obtain the security of the goods or other personal property of his debtor in the hands of a third person for the purpose of enforcing the appearance of the debtor to answer to an action, and afterwards, upon his continued default, of obtaining the property absolutely in satisfaction of the demand.

**ATTACK'.** The opening act of hostility by a force seeking to dislodge an enemy from its position. It is considered more advantageous to offer than to await attack, even in a defensive war. The historic forms of attack are: (1) the parallel; (2) the form in which both wings attack and the centre is kept back; (3) the form in which the centre is pushed forward and the wings kept

back; (4) the famous oblique mode, dating at least from Epaminonadas, and employed by Frederick the Great, where one wing advances to engage, whilst the other is kept back, and occupies the attention of the enemy by pretending an attack. Napoleon preferred to mass heavy columns against an enemy's centre. The forms of attack have changed with the weapons used. In the days of the pike heavy masses were the rule, but the use of the musket led to an extended battle-front to give effect to the fire. The advance in long and slender lines which grew out of this has been not less famous in the annals of British attack than the square formation in those of defence.

In the European War (1914-18) the Germans often attacked in mass-formation; but British attacks were usually carried out by successive *waves*; one wave secured its objective and consolidated it while another wave passed through to attack a more advanced objective. Artillery preparation became of increasingly great importance; it broke down the enemy's wire, counteracted his artillery-fire, and made his infantry keep under cover. In trench-to-trench attacks machine-guns and trench-mortars were of great value, and many casualties were avoided by the skilful use of tanks in the attack. But it is still a fundamental principle of tactics that the infantry is the chief factor in the attack, and that no attack can be considered overwhelmingly successful without the use of the bayonet.

**ATTAIN'DER.** The legal consequences of a sentence of death or outlawry pronounced against a person for treason or felony, the person being said to be *attainted*. It resulted in forfeiture of estate and "corruption of blood," rendering the party incapable of inheriting property or transmitting it to heirs; but these results now no longer follow. Formerly persons were often subjected to attainder by a special Bill or Act passed in Parliament called *Bills of Attainder*, the last being passed in 1798, in the case of Lord Edward Fitzgerald, one of the Irish rebel leaders.

**ATTAINT'.** A writ at common law against a jury for a false verdict, finally abolished in England in 1825.

**ATTALE'A.** A genus of American palms, comprising the piassava palm, which produces coquilla-nuts.

**ATT'ALUS.** The names of three kings of ancient Pergamus (241-133 B.C.), the last of whom bequeathed his kingdom to the Romans. They were all patrons of art and literature.

**AT'TAR.** In the East Indies, a general term for a perfume from flowers; in Europe generally used only of the *attar* or *otto of roses*, an essential oil made from *Rosa centifolia*, the hundred-leaved or cabbage-rose, *R. damascēna*, or damask-rose, *R. moschāta*, or musk-rose, etc., 100,000 roses yielding only 180 grains of attar. Cashmere, Shiraz, and Damascus are celebrated for its manufacture, and there are extensive rose farms in the valley of Kezanlik in Roumelia and at Ghazipur in Benares. The oil is at first greenish, but afterwards it presents various tints of green, yellow, and red. It is concrete at all ordinary temperatures, but becomes liquid about 84° F. It consists of two substances, a hydrocarbon and an oxygenated oil, and is frequently adulterated with the oils of rhodium, sandal-wood, and geranium, with the addition of camphor or spermaceti.

**AT'TERBURY, Francis.** An English prelate, born in 1662, and educated at Westminster and Oxford. In 1687 he took his degree of M.A., and appeared as a controversialist in a defence of the character of Luther, entitled, *Considerations on the Spirit of Martin Luther*, etc. He also assisted his pupil, the Hon. Charles Boyle, in his famous controversy with Bentley on the *Epistles of Phalaris*. Having taken orders in 1691 he settled in London, became chaplain to William and Mary, preacher of Bridewell, and lecturer of St. Bride's. Controversy was congenial to him, and in 1706 he commenced one with Dr. Wake, which lasted four years, on the rights, privileges, and powers of convocations. For this service he received the thanks of the lower house of convocation and the degree of Doctor of Divinity from Oxford. Soon after the accession of Queen Anne he was made Dean of Carlisle, aided in the defence of the famous Sacheverell, and wrote *A Representation of the Present State of Religion*. In 1712 he was made Dean of Christ Church, and in 1713 Bishop of Rochester and Dean of Westminster.

After the death of the queen in 1714 he distinguished himself by his opposition to George I.; and, having entered into a correspondence with the Pretender's party, was apprehended in Aug., 1722, and committed to the Tower. Being banished the kingdom, he settled in Paris, where he chiefly occupied himself in study

and in correspondence with men of letters. But even here, in 1725, he was actively engaged in fomenting discontent in the Scottish Highlands. He died in 1731, and his body was privately interred in Westminster Abbey. His sermons and letters are marked by ease and grace; but as a critic and a controversialist he is rather dexterous and popular than accurate and profound.

**ATTERCLIFFE.** A parliamentary division of the borough of Sheffield.

**ATTIC.** An architectural term variously used. An *Attic base* is a peculiar kind of base, used by the ancient architects in the Ionic order and by Palladio and some others in the Doric. An *Attic story* is a low story in the upper part of a house rising above the main portion of the building. In ordinary language an attic is an apartment lighted by a window in the roof.

**AT'TICA.** A State of ancient Greece, the capital of which is Athens. The territory was triangular in shape, with Cape Sunium (Colonna) as its apex and the ranges of Mounts Cithæron and Parnes as its base. On the north these ranges separated it from Bœotia; on the west it was bounded by Megaris and the Saronic Gulf; on the east by the Ægean.

**Physical features.** Its most marked physical divisions consisted of the highlands, midland district, and coast district, with the two famous plains of Eleusis and of Athens. The Cephissus and Ilissus, though small, were its chief streams; its principal hills, Cithæron, Parnes, Hymettus, Pentelicus, and Laurium. Its soil has probably undergone considerable deterioration, but produced good fruit, especially olives and figs. These are still cultivated, as well as the vine and cereals, but Attica is better suited for pasture than tillage.

**History.** According to tradition the earliest inhabitants of Attica lived in a savage manner until the time of Cecrops, who came, 1550 B.C., with a colony from Egypt, taught them all the essentials of civilization, and founded Athens. One of Cecrops' descendants founded eleven other cities in the regions round, and there followed a period of mutual hostility. To Theseus is assigned the honour of uniting these cities in a confederacy, with Athens as the capital, thus forming the Attic State. After the death of Codrus, 1068 B.C., the monarchy was abolished, and the government vested in archons elected by the nobility, at first for life, in 752 B.C. for ten years, and in 683 B.C. for one year only. The severe constitution of Draco was succeeded in 594 by the milder code of Solon, the democratic elements of which, after the brief tyranny of the Pisistratids, were emphasized and developed by Clisthenes. He divided the people into ten classes, and made the Senate consist of 500 persons, establishing as the Government an oligarchy modified by popular control.

Then came the splendid era of the Persian War, which elevated Athens to the summit of fame. Miltiades at Marathon, and Themistocles at Salamis, conquered the Persians by land and by sea. The chief external danger being removed, the rights of the people were enlarged; the archons and other magistrates were chosen from all classes without distinction.

The period from the Persian War to the time of Alexander (500 to 336 B.C.) was most remarkable for the development of the Athenian constitution. Attica appears to have contained a territory of nearly 850 sq. miles, with some 500,000 inhabitants, 360,000 of whom were slaves, while the inhabitants of the city numbered 180,000. Cimon and Pericles (444 B.C.) raised Athens to its point of greatest splendour, though under the latter began the Peloponnesian War, which ended with the conquest of Athens by the Lacedæmonians. The succeeding tyranny of the Thirty, under the protection of a Spartan garrison, was overthrown by Thrasybulus, with a temporary partial restoration of the power of Athens; but the battle of Cheronæa (338 B.C.) made Attica, in common with the rest of Greece, a dependency of Macedon. The attempts at revolt after the death of Alexander were crushed, and in 260 B.C. Attica was still under the sway of Antigonus Gonatas, the Macedonian king.

A period of freedom under the shelter of the Achæan League then ensued, but their support of Mithridates led, in 146 B.C., to the subjugation of the Grecian States by Rome. After the division of the Roman Empire, Attica belonged to the Empire of the East until, in A.D. 396, it was conquered by Alaric the Goth and the country devastated. Attica and Bœotia now form a nome or province of the kingdom of Greece, with a population of 407,063.—
BIBLIOGRAPHY: Sir J. G. Frazer, *Pausanias's Description of Greece*, vols. ii. and v.; C. Wordsworth, *Athens and Attica*.

**AT'TICUS, Titus Pomponius.** A Roman of great wealth and culture, born 109 B.C., and died 32 B.C. On the death of his father he removed

to Athens to avoid participation in the civil war, to which his brother Sulpicius had fallen a victim. There he so identified himself with Greek life and literature as to receive the surname Atticus. It was his principle never to mix in politics, and he lived undisturbed amid the strife of factions. Sulla and the Marian party, Cæsar and Pompey, Brutus and Antony, were alike friendly to him, and he was in favour with Augustus. Of his close friendship with Cicero proof is given in the series of letters addressed to him by Cicero.

He married at the age of fifty-three, and had one daughter, Pomponia, named by Cicero Atticula and Attica. He reached the age of seventy-seven years without sickness, but, being then attacked by an incurable disease, ended his life by voluntary starvation. He was a type of the refined Epicurean, and an author of some contemporary repute, though none of his works have reached us.— The name Atticus was given to Addison by Pope, in a well-known passage (Prologue to the *Satires*, addressed to Dr. Arbuthnot).

**AT'TILA** (in Ger. *Etzel*). The famous leader of the Huns, was the son of Mundzuk, and the successor, in conjunction with his brother Bleda, of his uncle Roua. The rule of the two leaders extended over a great part of Northern Asia and Europe, and they threatened the Eastern Empire, and twice compelled the weak Theodosius II. to purchase an inglorious peace. Attila caused his brother Bleda to be murdered (444), and in a short time extended his dominion over all the peoples of Germany and exacted tribute from the Eastern and Western emperors. The Vandals, the Ostrogoths, the Gepidæ, and a part of the Franks united under his banners, and he speedily formed a pretext for leading them against the Empire of the East. He laid waste all the countries from the Black to the Adriatic Sea, and in three encounters defeated the Emperor Theodosius, but could not take Constantinople. Thrace, Macedonia, and Greece all submitted to the invader, who destroyed seventy flourishing cities; and Theodosius was obliged to purchase a peace.

Turning to the west, the "scourge of God," as his defeated enemies termed him, crossed with an immense army the Rhine, the Moselle, and the Seine, came to the Loire, and laid siege to Orleans. The inhabitants of this city repelled the first attack, and the united forces of the Romans under Aetius, and of the Visigoths, under their king, Theodoric, compelled Attila to raise the siege. He retreated to Champagne, and waited for the enemy in the plains of Châlons. In apparent opposition to the prophecies of the soothsayers the ranks of the Romans and Goths were broken; but when the victory of Attila seemed assured, the Gothic prince Thorismond, the son of Theodoric, poured down from the neighbouring height upon the Huns, who were defeated with great slaughter.

Rather irritated than discouraged, he sought in the following year a new opportunity to seize upon Italy, and demanded Honoria, the sister of Valentinian III., in marriage, with half the kingdom as a dowry. When this demand was refused he conquered and destroyed Aquileia, Padua, Vicenza, Verona, and Bergamo, laid waste the plains of Lombardy, and was marching on Rome when Pope Leo I. went with the Roman ambassadors to his camp and succeeded in obtaining a peace.

Attila went back to Hungary, and died on the night of his marriage with Hilda or Ildico (453), either from the bursting of a blood-vessel or by her hand. The description that Jordanès (or Jornandes) has left us of him is in keeping with his Kalmuck-Tartar origin. He had a large head, a flat nose, broad shoulders, and a short and ill-formed body; but his eyes were brilliant, his walk stately, and his voice strong and well-toned. — BIBLIOGRAPHY: Thierry, *Koenig Attila und seine Zeit*; E. Hutton, *Attila and the Huns*.

**ATTILLY.** A village in France. *See* SCARPE, BATTLE OF THE.

**ATTLEBOROUGH.** A manufacturing town of the United States, in Massachusetts. Pop. 19,731.

**AT'TOCK.** A town and fort in Rawal Pindi district, Punjab, overhanging the Indus at the point where it is joined by the Kabul River. It is at the head of the steam navigation of the Indus, and is connected with Lahore by railway. It is an important post on the military road to the frontier. Pop. 2822.

**ATTOR'NEY.** A person appointed to do something for and in the stead and name of another. An attorney may have *general* powers to act for another; or his power may be *special*, and limited to a particular act or acts. A special attorney is appointed by a deed called a *power* or *letter of attorney*, specifying the acts which he is authorized to do.

An *attorney at law* is a person

qualified to appear for another before a court of law to prosecute or defend any action on behalf of his client. The term in England was formerly applied especially to those practising before the supreme courts of common law at Westminster, and corresponded to the term *solicitor* used in courts of Chancery; but this distinction was abolished in 1873, and *solicitor* is now the regular term for all such legal agents. In the United States the term is in common use, and is wide enough to include what in England would be called barristers (or counsel), in Scotland advocates, having indeed the general sense of lawyer. Since 1920 both branches of the legal profession in the British Isles have been open to women.

**ATTORNEY-GENERAL.** In England and Ireland, the first law-officer and legal adviser of the Crown, acting on its behalf in its revenue and criminal proceedings, carrying on prosecutions in crimes that have a public character, guarding the interests of charitable endowments, and granting patents. He is *ex officio* the leader of the bar, and, as a member of Parliament, has charge of all Government measures on legal questions. The Solicitor-General holds a similar position, and may act in his place. In Scotland the Attorney-General is called Lord-Advocate. There are also Attorneys-General in the colonies. In the United States he is head of the Department of Justice. The individual States have also an Attorney-General.

**ATTRAC'TION.** The tendency of all material bodies, whether masses or particles, to approach each other, to unite, and to remain united. Newton was the first to adopt the theory of a universal attractive force, and to determine its laws. When bodies tend to come together from sensible distances the tendency is termed either the attraction of *gravitation*, *magnetism*, or *electricity*, according to circumstances; when the attraction operates at insensible distances it is known as *adhesion* with respect to surfaces, as *cohesion* with respect to the particles of a body, and as *affinity* when the particles of different bodies tend together. It is by the attraction of gravitation that all bodies fall to the earth when unsupported.—BIBLIOGRAPHY: Newton, *Principia*; Thomson and Tait, *Natural Philosophy*; Laplace, *Mécanique Céleste*; Poynting, *The Mean Density of the Earth*.

**AT'TRIBUTE.** In philosophy a quality or property of a substance, as whiteness or hardness. A substance is known to us only as a congeries of attributes.

In the fine arts an attribute is a symbol regularly accompanying and marking out some personage. Thus the caduceus, purse, winged hat, and sandals are attributes of Mercury, the trampled dragon that of St. George.

**ATTWOOD, George, F.R.S.** An English mathematician, born 1746, died 1807, best known by his invention, called after him *Attwood's Machine*, for verifying the laws of falling bodies. It consists essentially of a freely-moving pulley over which runs a fine cord with two equal weights suspended from the ends. A small additional weight is laid upon one of them, causing it to descend with uniform acceleration. Means are provided by which the added weight can be removed at any point of the descent, thus allowing the motion to continue from this point onward with uniform velocity. *See* GRAVITATION.

**ATYS,** or **ATTIS** (at'is). In classical mythology, the shepherd lover of Cybèle, who, having broken the vow of chastity which he made her, castrated himself. In Asia Minor Atys seems to have been a deity, with somewhat of the same character as Adonis. Catullus has written a celebrated poem (Carmen 63) on the subject of Attis.

**AUBAGNE** (ō-bàn-yė). A town in France, department of Bouches-du-Rhône, with manufactures of cottons, pottery, cloth. Pop. 8800.

**AUBAINE, DROIT d'** (drwä dō-bān). *See* DROIT D'AUBAINE.

**AUBE** (ōb). A N.E. French department; area, 2326 sq. miles; pop. (1926), 238,253. The surface is undulating, and watered by the Aube, etc. The N. and N.W. districts are bleak and infertile, the southern districts remarkably fertile. A large extent of ground is under forests and vineyards, and the soil is admirable for grain, pulse, and hemp. The chief manufactures are worsted and hosiery. Troyes is the capital.—The River Aube, which gives name to the department, rises in Haute-Marne, flows N.W., and after a course of 113 miles joins the Seine.

**AUBENAS** (ōb-nä). A town of France, department Ardèche, with a trade in coal, silk, etc. Pop. 7206.

**AUBER** (ō-bār), **Daniel François Esprit.** A French operatic composer, born 1782, at Caen, in Normandy, died at Paris, 1871. He was originally intended for a mercantile career, but devoted himself to music,

studying under Cherubini. His first great success was his opera *La Bergère Châtelaine*, produced in 1820. In 1822 he had associated himself with Scribe as librettist, and other operas now followed in quick succession. Chief among them were *Masaniello* or *La Muette de Portici* (1828), *Fra Diavolo* (1830), *Lestocq* (1834), *L'Ambassadrice* (1836), *Le Domino Noir* (1837), *Les Diamants de la Couronne* (1841), *Marco Spada* (1853), *La Fiancée du Roi de Garbe* (1864). Despite his success in *Masaniello*, his peculiar field was comic opera, in which his charming melodies, bearing strongly the stamp of the French national character, his uniform grace and piquancy, won him a high place.

**AUBERGINE** (ō'bĕr-zhēn). The fruit of the egg-plant (q.v.).

**AUBERVILLIERS** (ō-bār-vēl-yā). A suburban locality of Paris, with a fort belonging to the defensive works of the city. Pop. 37,558.

**AUBIGNÉ, Merle d'.** *See* MERLE D'AUBIGNÉ.

**AUBIN** (ō-baṇ). A town of Southern France, department of Aveyron, 20 miles N.E. of Villefranche; mining district; coal, sulphur, alum, and iron. Pop. 9574.

**AU'BREY, John, F.R.S.** An English antiquary, born in Wiltshire in 1625 or 1626, died about 1700. He was educated at Oxford; collected materials for the *Monasticon Anglicanum*, and afforded important assistance to Wood, the antiquary. He left large collections of manuscripts, which have been used by subsequent writers. His *Miscellanies* (London, 1696) contain much curious information, but display credulity and superstition. His *Survey of Surrey* was incorporated in Rawlinson's *Natural History and Antiquities of the County of Surrey*, which was published in 1719.

**AU'BURN.** The name of many places in America, the chief being a handsome city of New York State, at the north end of Owasco Lake. It is chiefly famous for its State prison, large enough to receive 1000 prisoners. In the town or vicinity various manufactures are carried on. Pop. 36,142.—Another Auburn is in Maine, on the Androscoggin River, a manufacturing town. Pop. 16,985.

**AUBUSSON** (ō-bŭ-sōṇ). A town of the interior of France, department Creuse, celebrated for its carpets. Pop. 7211.

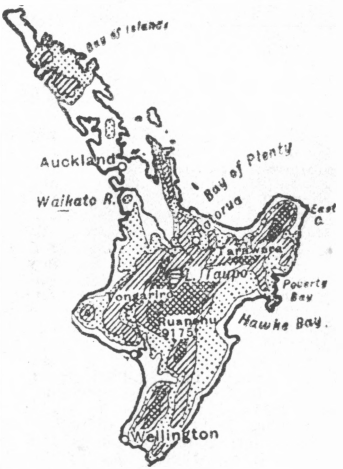
**AUBUSSON** (ō-bŭ-sōṇ), **Pierre d'.** Grand-master of the knights of St. John of Jerusalem, born in 1423 of a noble French family, served in early life against the Turks, then entered the order of St. John, obtained a commandery, was made grand-prior, and in 1476 succeeded the Grand-master Orsini. In 1480 the Island of Rhodes, the headquarters of the order, was invaded by a Turkish army of 100,000 men. The town was besieged for two months and then assaulted, but the Turks were obliged to retire with great loss. He died at Rhodes in 1503.

**AUCH** (ōsh). A town in S.W. France, capital of department Gers; the seat of an archbishop, with one of the finest Gothic cathedrals in France; manufactures linens, leather, etc. Pop. 13,638.

**AUCHENIA** (a-kē'ni-a). *See* LLAMA.

**AUCHTERAR'DER.** A burgh, Perthshire, Scotland, with manufactures of tweeds, tartans, etc. The opposition to the presentee to the church of Auchterarder (1839) originated the struggle which ended in the formation of the Free Church of Scotland. Pop. (1931), 2254.

**AUCK'LAND.** A town of New Zealand, in the North Island, founded in 1840, and situated on Waitemata Harbour, one of the finest harbours




North Island, New Zealand, showing position of Auckland

of New Zealand, where the island is only 6 miles across, there being another harbour (Manukau) on the opposite side of the isthmus. At dead low water there is sufficient depth in the harbour for the largest

steamers. The working ship channel has an average depth of 36 feet, and varies in width from 1 to 2 miles. The harbour has two good entrances, with a lighthouse; and is defended by batteries. There are numerous wharves and jetties, and two graving-docks, one of which—the Calliope Dock, opened in 1887—is one of the largest in the whole of the Southern Seas.

Its site is picturesque, the streets are spacious, and the public buildings—churches, educational establishments, including a university college—are numerous and handsome. It has a large and increasing trade, there being connection with the chief places on the island by rail, and regular communication with the other ports of the colony, Australia, and Fiji by steam. It was formerly the capital of the colony. Pop. (with suburbs) (1926), 192,176.—The provincial district of Auckland forms the northern part of North Island, with an area of 25,364 sq. miles. Pop. (1926), 424,925. The surface is diversified; volcanic phenomena are common, including geysers, hot lakes, etc.; rivers are numerous; wool, timber, kauri-gum, etc., are exported. Much gold has been obtained in the Thames valley and elsewhere.

**AUCKLAND, William Eden, Lord.** An English statesman, born 1744; educated at Eton and Oxford, called to the bar 1768, Under-Secretary of State, 1772, and in 1776 a lord of the Board of Trade. In 1778 he was nominated in conjunction with Lord Howe and others to act as mediator between Britain and the insurgent American colonies. He was afterwards Secretary of State for Ireland, Ambassador Extraordinary to France, Ambassador Extraordinary to the Netherlands, etc. He was raised to the peerage in 1788, and died in 1814.

**AUCKLAND ISLANDS.** A group of islands about 180 miles S. of New Zealand, discovered in 1806, and belonging to Britain. They are of volcanic origin and fertile; and the largest, which is 30 miles by 15, has two good harbours. There are no settled inhabitants.

**AUCTION.** Is a public sale to the party offering the best price where the buyers bid against each other, or to the bidder who first accepts the terms offered by the vendor where he sells by reducing his terms until some one accepts them. The latter form is known as a *Dutch Auction*. A sale by auction must be conducted in the most open and public manner possible; and there must be no collusion on the part of the buyers. Puffing, or mock bidding, to raise the value by apparent competition, is illegal.

**AUCTIONEER'.** A person who conducts sales by auction. It is his duty to state the conditions of sale, to declare the respective biddings, and to terminate the sale by *knocking down* the thing sold to the highest bidder. In Britain an auctioneer must have a licence (for which he pays £10), renewable annually. Verbal declarations by an auctioneer are not suffered to control the printed conditions of sale. The Auctioneers' Institute of the United Kingdom was founded in 1886.

**AU'CUBA.** A genus of plants, ord. Cornaceæ, one species of which, *A. japonica*, a laurel-like shrub with spotted leaves, a native of Japan and China, is now common in ornamental grounds in Europe. The flowers are dicœcious and inconspicuous. For a long time only the female plant, introduced into Britain from Japan in 1783, was cultivated, but in 1850 the male was introduced, and the fruit, which consists of beautiful coral-red berries, is now frequently developed, and adds greatly to the attractiveness of the plant. *A. himalaica*, also brought to Europe, is less hardy.

**AUDE** (ōd). A maritime department in the S. of France; area 2448 sq. miles, mainly covered by hills belonging to the Pyrenees or the Cevennes, and traversed W. to E. by a valley drained by the Aude. The loftier districts are bleak and unproductive; the others tolerably fertile, yielding good crops of grain. The wines, especially the white wines, are famous; olives and other fruits are also cultivated. The manufactures are varied; the trade is facilitated by the Canal du Midi. Caracassonne is the capital; other towns are Narbonne and Castelnaudary. Pop. (1926), 291,951. The River Aude rises in the Eastern Pyrenees, and, flowing nearly parallel to the Canal du Midi, falls into the Mediterranean after a course of 130 miles.

**AUDEBERT** (ōd-bār), **Jean Baptiste.** French engraver and naturalist, born in 1759, died in 1800; published *Histoire Naturelle des Singes, des Makis, et des Galéopithèques*; *Histoire des Colibris*, etc.; and began *Histoire des Grimpereaux et des Oiseaux de Paradis*, finished by Desray—all finely-illustrated works.

**AU'DENSHAW.** A town of England, in Lancashire, 4 miles E. of Manchester, with cotton-mills, engineering-works, etc. Pop. (1931) 8460.

**AUDIOMETER.** An instrument for the measurement of hearing, invented by Professor D. E. Hughes, of London, in 1879.

**AU'DIPHONE.** An acoustic instrument by means of which deaf persons are enabled to hear. It consists essentially of a fan-shaped plate of hardened caoutchouc, which is bent to a greater or less degree by strings, and is very sensitive to sound-waves. When used, the up edge is pressed against the upper front teeth, with the convexity outward, and the sounds being collected are conveyed from the teeth to the auditory nerve without passing through the external ear.

**AU'DIT.** An examination into accounts or dealings with money or property, along with vouchers or other documents connected therewith, especially by proper officers, or persons appointed for the purpose. Also the occasion of receiving the rents from the tenants on an estate.

**AU'DITOR.** A person appointed to examine accounts, public or private, to see whether they are correct and in accordance with vouchers. In Britain the public accounts are audited by the Exchequer and Audit Department, Somerset House, at the head of it being a comptroller and auditor-general, and an assistant-comptroller and auditor, with a large staff of clerks. In Scotland there is an auditor attached to the Court of Session appointed to tax costs in litigation.

**AUDITORY NERVES.** *See* EAR.

**AUDLEY.** A town (urban district) of England, in Staffordshire, to the north-west of the district of The Potteries, with coal and iron mines. Pop. (1931), 13,619.

**AUDRAN** (ō-drăn), **Gerard.** A celebrated French engraver, born 1640; studied at Rome; was appointed engraver to Louis XIV.; died at Paris 1703. He engraved Le Brun's *Battles of Alexander*, two of Raphael's cartoons, Poussin's *Coriolanus*, etc., and takes a first place among historical engravers. Other members of the family were successful in the same profession: Benoît, 1661-1721; Claude *père*, 1592-1677; Claude *fils*, 1640; Germain, 1631-1710; Jean, 1667-1756.

**AU'DUBON, John James.** An American naturalist of French extraction, born near New Orleans in 1775, was educated in France, and studied painting under David. In 1798 he settled in Pennsylvania, but having a great love for ornithology he set out in 1810 with his wife and child, descended the Ohio, and for many years roamed the forests in every direction, drawing the birds which he shot. In 1826 he came to England, exhibited his drawings in Liverpool, Manchester, and Edinburgh, and finally published them in an unrivalled work of double-folio size, with 435 coloured plates of birds the size of life (*The Birds of America*, 4 vols., 1827-39), with an accompanying text (*Ornithological Biography*, 5 vols., 8vo., partly written by Professor Macgillivray). On his final return to America he laboured with Dr. Bachman on a finely-illustrated work entitled *The Quadrupeds of America* (1843-50, 3 vols.). He died at New York in 1851.

**AUERBACH.** A manufacturing town of Germany, in Saxony. Pop. 2200.

**AUERBACH** (ou'ĕr-bäh), **Berthold.** A distinguished German author of Jewish extraction, born 1812, died 1882. He abandoned the study of Jewish theology in favour of philosophy, publishing in 1836 his *Judaism and Modern Literature*, and a translation of the works of Spinoza with critical biography (5 vols., 1841). His later works were tales or novels, and his *Village Tales of the Black Forest* (*Schwarzwälder Dorfgeschichten*), as well as others of his writings, have been translated into several languages. Other works: *Barfüssele*, *Joseph im Schnee*, *Edelweiss*, *Auf der Höhe*, *Das Landhaus am Rhein*, *Waldfried*, *Brigitta*.

**AUERSTÄDT** (ou'ĕr-stet). Battle at, 14th Oct., 1806. *See* JENA.

**AUGEAS** (ą-jē'as). A fabulous king of Elis, in Greece, whose stable contained 3000 oxen, and had not been cleaned for thirty years. Hercules undertook to clear away the filth in one day in return for a tenth part of the cattle, and executed the task by turning the River Alphēus through it. Augeas, having broken the bargain, was deposed and slain by Hercules.

**AUGER** (ą'gėr). An instrument for boring holes considerably larger than those bored by a gimlet, used by carpenters and joiners, ship-wrights, etc.

**AUGEREAU** (ōzh-rō), **Pierre François Charles.** Duke of Castiglione, Marshal of France, son of a mason, born at Paris, 1757. He adopted the life of a soldier, and by 1796 had reached the rank of general of division in the army of Italy. At Casale, Lodi, Castiglione, and Arcole he highly distinguished himself. In 1797 he was at Paris, and was the

instrument of the *coup d'état* of the 18th of Fructidor (4th Sept.). In 1799 he was chosen a member of the Council of Five Hundred. He then obtained the command of the army in Holland, and fought till the end of the campaign. In 1803 he was appointed to lead the army collected at Bayonne against Portugal. In 1804 he was named marshal of the empire, and grand officer of the Legion of Honour. He subsequently took part in the battles of Jena and Eylau, held a command in Spain, and in July, 1813, led the army in Bavaria against Saxony, taking part in the battle of Leipzig. On Napoleon's abdication he submitted to Louis XVIII., who named him a peer. He died 1816.

**AUGHRIM.** A village in Co. Galway, Ireland, memorable for the decisive victory gained in the neighbourhood, 12th July, 1691, by the forces of William of Orange, under Ginkel, over the Irish and French troops, under St. Ruth. The total English casualties were about 1700, while the Irish lost at least 7000 men as well as all their war material. This battle caused the complete submission of the country.

**AUGIER** (ō-zhi-ā), **Emile.** Noted French dramatist, born 1820, came young to Paris, entered a lawyer's office, but relinquished law for literature; elected an academician in 1857, in 1868 a commander of the Legion of Honour. His first and one of his best dramas was the comedy *La Ciguë* (1844); among his other works are *L'Aventurière, Gabrielle, Paul Forestier, Le Mariage d'Olympe, Le Gendre de M. Poirier, Les Effrontés, Le Fils de Giboyer, Les Lions et les Renards, Maître Guérin, Les Fourchambault,* etc. He died in 1889.

**AUGITE** (ą'jit). Is the commonest member of the pyroxene group of minerals; a constituent of many igneous rocks, such as basalt, gabbro, etc. It crystallizes in short almost rectangular prisms of the monoclinic system, modifying planes causing cross-sections to be eight-sided. Its specific gravity is about 3.2; lustre vitreous; hardness sufficient to scratch glass; colour usually dark. It is a silicate of calicum, magnesium, iron, and aluminium, and alters in geological time by slow recrystallization into hornblende, possibly with some loss of calcium. It may be imitated by the artificial fusion of its constituents. A transparent, green, non-aluminous variety found at Zillertal, in Tyrol, is used in jewellery.

**AUGSBURG** (ougz'burh; Lat. *Augusta Vindelico.um*). A city of Bavaria, at the junction of the Wertach and Lech, antique in appearance, but with some fine streets, squares, and handsome or interesting buildings, including a splendid town hall, a lofty belfry (Perlach Tower), cathedral, with paintings by Domenichino, Holbein, etc.; St. Ulrich's Church; the bishop's palace, where the Augsburg Confession was presented to the Diet, afterwards a royal residence; the Fugger Palace, or mansion of the celebrated Fugger family; the public library; the theatre; the Academy of Arts; and the Fuggerei, a separate quarter of the city, consisting of fifty-three small houses, tenanted at a merely nominal rent by indigent Roman Catholics.

Augsburg was a renowned commercial centre in the Middle Ages, and is still an important emporium of South German and Italian trade; industries: cotton spinning and weaving, dyeing, woollen manufacture, machinery and metal goods, books and printing, chemicals, etc. The Emperor Augustus established a colony here about 12 B.C. In 1276 it became a free city, and, besides being a great mart for the commerce between the north and south of Europe, it was a great centre of German art in the Middle Ages. It early took a conspicuous part in the Reformation. (See next article). In 1806 it was incorporated in Bavaria. Pop. (1925), 165,522.

**AUGSBURG CONFESSION.** A document which was presented by the Protestants at the Diet of Augsburg, 1530, to the Emperor Charles V. and the Diet, and being signed by the Protestant States was adopted as their creed. Luther made the original draft; but as its style appeared too violent it was given to Melanchthon for amendment. The original is to be found in the imperial Austrian archives. Afterwards Melanchthon arbitrarily altered some of the articles, and there arose a division between those who held the original and those who held the altered Augsburg Confession. The former is received by the Lutherans, the latter by the German Reformed.

**AU'GURS.** A board or college of diviners who, amongst the Romans, predicted future events and announced the will of the gods from the occurrence of certain signs. These consisted of signs in the sky, especially thunder and lightning; signs from the flight and cries of birds; from the feeding of the sacred chickens; from the course taken or sounds uttered by various quadru-

peds or by serpents; from accidents or occurrences, such as spilling the salt, sneezing, etc. The answers of the augurs as well as the signs by which they were governed were called *auguries*, but bird-predictions were properly termed *auspices*. Nothing of consequence could be undertaken without consulting the augurs, and by the mere utterance of the words *alio die* ("meet on another day") they could dissolve the assembly of the people and annul all decrees passed at the meeting.

**AU'GUST.** The eighth month from January. It was the sixth of the Roman year, and hence was called *Sextilis* till the Emperor Augustus affixed to it his own name.

**AUGUS'TA.** The name of many ancient places, as Augusta Trevirorum, now *Trèves*; Augusta Taurinorum, now *Turin*; Augusta Vindelicorum, now *Augsburg*; etc.

**AUGUSTA** (ou-gus'tà), or **AGOS'TA.** A seaport in the south-east of Sicily, 12 miles north of Syracuse. It exports salt, oil, honey, etc. Pop. 15,000.

**AUGUS'TA.** Capital of Maine, United States, on the River Kennebec, which is crossed by a bridge and is navigable for small vessels 43 miles from its mouth, while a dam enables steamboats to ply for 20 miles farther up and furnishes immense water-power. Pop. (1920), 14,144.

**AUGUSTA.** The capital of Richmond county, Georgia, United States, on the left bank of the Savannah River, 231 miles from its mouth; well built, and connected with the river by high-level canals; an important manufacturing centre, having cotton-mills, machine-shops, and railroad works, etc. Pop. (1920), 52,548.

**AU'GUSTINE** (Aurelius Augustinus), **St.** A renowned father of the Christian Church, was born at Tagaste, in Africa, in 354, his mother Monica being a Christian, his father Patricius a pagan. His parents sent him to Carthage to complete his education, but he disappointed their expectations by his neglect of serious study and his devotion to pleasure. A lost book of Cicero's, called *Hortensius*, led him to the study of philosophy; but dissatisfied with this he went over to the Manichæans. He was one of their disciples for nine years, but left them, went to Rome, and thence to Milan, where he announced himself as a teacher of rhetoric. St. Ambrose, the bishop of this city, converted him to the faith of his boyhood, and the reading of Paul's *Epistles* wrought an entire change in his life and character. He retired into solitude, and prepared himself for baptism, which he received in his thirty-third year from the hands of Ambrose. Returning to Africa, he sold his estate and gave the proceeds to the poor, retaining only enough to support him.

At the desire of the people of Hippo, Augustine became the assistant of the bishop of that town, preached with extraordinary success, and in 395 succeeded to the see. He entered into a warm controversy with Pelagius concerning the doctrines of free-will, grace, and predestination, and wrote treatises concerning them, but of his various works his *Confessions* is most secure of immortality.

He died 28th Aug., 430, while Hippo was besieged by the Vandals. He was a man of great enthusiasm, self-devotion, zeal for truth, and powerful intellect, and though there have been fathers of the Church more learned, none have wielded a more powerful influence. His doctrine of grace, which was an important contribution to Christian thought, triumphed at last in the Reformation and evangelical religion. His writings are partly autobiographical, as the *Confessions*, partly polemical, homiletic, or exegetical. The greatest is the *City of God* (*De Civitate Dei*), a vindication of Christianity.—BIBLIOGRAPHY: Joseph McCabe, *St. Augustine and his Age*; Nourrisson, *La Philosophie de St. Augustin*.

**AU'GUSTINE,** or **AUSTIN, St.** The *Apostle of the English*, first Archbishop of Canterbury, flourished at the close of the sixth century, was sent, in 596, with forty monks by Pope Gregory I. to introduce Christianity into Saxon England, and was kindly received by Ethelbert, King of Kent, whom he converted, baptising 10,000 of his subjects in one day. In acknowledgment of his tact and success Augustine received the archiepiscopal pall from the Pope, with instructions to establish twelve sees in his province, but he could not persuade the British bishops in Wales to unite with the new English Church. He died in 604 or 605. Cf. Sir H. H. Howorth, *St. Augustine of Canterbury*.

**AU'GUSTINS,** or **AUGUSTINES.** Members of several monastic fraternities who follow rules framed by the great St. Augustine, or deduced from his writings, of which the chief are the Canons Regular of St. Augustine, or Austin Canons, and the Begging Hermits or Austin Friars. The Austin Canons were introduced into Britain about 1100,

and had about 170 houses in England and about twenty-five in Scotland. They took the vows of chastity and poverty, and their habit was a long black cassock with a white rochet over it, having over that a black cloak and hood. The Austin Friars, originally hermits, were a much more austere body, went barefooted, and formed one of the four orders of mendicants. An order of nuns had also the name of Augustines. Their garments, at first black, were afterwards violet.

**AUGUSTO'VO.** A town of Poland, formerly in Russia, in the government of Suwalki, founded in 1557 by Sigismund II. Pop. 11,797. The battle of Augustovo was fought between the Russians and the Germans between 14th Sept. and 3rd Oct., 1914.

**AUGUS'TULUS, Romulus.** The last of the Western Roman emperors; reigned for one year (475-6), when he was overthrown by Odoacer and banished.

**AUGUS'TUS, Gaius Julius Cæsar Octavianus** (originally called **Gaius Octavius**). Roman emperor, was the son of Gaius Octavius and Atia, a daughter of Julia, the sister of Julius Cæsar. He was born 63 B.C., and died A.D. 14. Octavius was at Apollonia, in Epirus, when he received news of the death of his uncle (44 B.C.), who had previously adopted him as his son. He returned to Rome to claim Cæsar's property and avenge his death, and now took, according to usage, his uncle's name with the surname Octavianus. He was aiming secretly at the chief power, but at first he joined the republican party, and assisted at the defeat of Antony at Mutina. He got himself chosen consul in 43. Soon after the second triumvirate was formed between him and Antony and Lepidus, and this was followed by the conscription and assassination of three hundred Senators and two thousand knights of the party opposed to the triumvirate.

Next year Octavianus and Antony defeated the republican army under Brutus and Cassius at Philippi. The victors now divided the Roman world between them, Octavianus getting the West, Antony the East, and Lepidus Africa. Sextus Pompeius, who had made himself formidable at sea, had now to be put down; and Lepidus, who had hitherto retained an appearance of power, was deprived of all authority (36 B.C.) and retired into private life. Antony and Octavianus now shared the Empire between them; but while the former, in the East, gave himself up to a life of luxury, and alienated the Romans by his alliance with Cleopatra and his adoption of Oriental manners, Octavianus skilfully cultivated popularity, and soon declared war ostensibly against the Queen of Egypt.

The naval victory of Actium, in which the fleet of Antony and Cleopatra was defeated, made Octavianus master of the world, 31 B.C. He returned to Rome, 29 B.C., celebrated a splendid triumph, and caused the temple of Janus to be closed in token of peace being restored. Gradually all the highest offices of State, civil and religious, were united in his hands, and the new title of Augustus was also assumed by him, being formally conferred by the Senate in 27 B.C. Great as was the power given to him, he exercised it with wise moderation, and kept up the show of a republican form of government. Under him successful wars were carried on in Africa and Asia (against the Parthians), in Gaul and Spain, in Pannonia, Dalmatia, etc.; but the defeat of Varus by the Germans under Arminius with the loss of three legions, A.D. 9, was a great blow to him in his old age.

Many useful decrees proceeded from him, and various abuses were abolished. He gave a new form to the Senate, employed himself in improving the morals of the people, enacted laws for the suppression of luxury, introduced discipline into the armies, and order into the games of the circus. He adorned Rome in such a manner that it was said: "He found it of brick, and left it of marble." The people erected altars to him, and, by a decree of the Senate, the month Sextilis was called *Augustus* (our August). He was a patron of literature; Virgil and Horace were befriended by him, and their works and those of their contemporaries are the glory of the *Augustan Age*. His death, which took place at Nola, plunged the Empire into the greatest grief. He was thrice married, but had no son, and was succeeded by his stepson Tiberius, whose mother Livia he had married after prevailing on her husband to divorce her.—BIBLIOGRAPHY: J. B. Firth, *Augustus Cæsar* (in Heroes of the Nations series); E. S. Shuckburgh, *Augustus*.

**AUGUSTUS II.** (or **FREDERICK AUGUSTUS I.**). Elector of Saxony and King of Poland, second son of John George III., Elector of Saxony, was born at Dresden in 1670, died at Warsaw, 1733. He succeeded his brother in the Electorate in 1694, and the Polish throne having become vacant, in 1696, by the death of

John Sobieski, Augustus presented himself as a candidate for it and was successful. He joined with Peter the Great in the war aainst Charles XII. of Sweden, invaded Livonia, but was defeated by Charles near Riga, and at Clissow, between Warsaw and Cracow. In 1704 he was deposed, and two years later formally resigned the crown to Stanislaus I., now devoting himself to his Saxon dominions.

In 1709, after the defeat of Charles at Poltava, the Poles recalled Augustus, who united himself anew with Peter. The two monarchs, in alliance with Denmark, sent troops into Pomerania, but the Swedish general Steinbock defeated the allies at Gadebusch, 20th Dec., 1712. The death of Charles XII. put an end to the war, and Augustus concluded a peace with Sweden. A confederation was now formed in Poland against the Saxon troops, but through the mediation of Peter an arrangement was concluded by which the Saxon troops were removed from the kingdom.

Augustus now gave himself up to voluptuousness and a life of pleasure. His Court was one of the most splendid and polished in Europe. The Poles yielded but too readily to the example of their king, and the last years of his reign were characterized by boundless luxury and corruption of manners. His wife left him one son. The Countess of Königsmark bore him the celebrated commander Marshal Saxe (Maurice of Saxony).

**AUGUSTUS III.** (or **FREDERICK AUGUSTUS II.**), Elector of Saxony and King of Poland, son of Augustus II., born at Dresden, 1696, succeeded his father as Elector in 1733, and was chosen King of Poland, through the influence of Austria and Russia. He closely followed the example of his father, distinguishing himself by the splendour of his feasts and the extravagance of his Court. He preferred Dresden to Warsaw, and through his long absence from Poland the government sank into entire inactivity. During the first Silesian war he formed a secret alliance with Austria. The consequence was that during the second Silesian war Frederick the Great of Prussia pushed on into Saxony, and occupied the capital, from which Augustus fled.

By the peace of Dresden, 25th Dec., 1745, he was reinstated in the possession of Saxony. In 1756 he was involved anew in a war against Prussia. When Frederick declined his proposal of neutrality he left Dresden, and entered the camp at Pirna, where 17,000 Saxon troops were assembled. Frederick surrounded the Saxons, who were obliged to surrender, and Augustus fled to Poland. On the threat of invasion by Russia he returned to Dresden, where he died in 1763. His son, Frederick Christian, succeeded him as Elector of Saxony, and Stanislaus Poniatowski as King of Poland.

**AUK.** A name of certain swimming birds, family Alcidæ, including the great auk, the little auk, the puffin, etc. The genus Alca, or auks proper, contains only two species, the great auk (*Alca impennis*), and the razor-bill (*Alca torda*). The great auk or gair-fowl, a bird about 3 feet in length, used to be plentiful in

Razor-bill (*Alca torda*)

northerly regions, and also visited the British shores, but has become extinct. Some seventy skins, about as many eggs, with bones representing perhaps a hundred individuals, are preserved in various museums. Though the largest species of the family, the wings were only 6 inches from the carpal joint to the tip, totally useless for flight, but employed as fins in swimming, especially under water. The tail was about 3 inches long; the beak was high, short, and compressed; the head, neck, and upper parts were blackish; a large spot under each eye, and most of the under parts white. Its legs were placed so far back as to cause it to sit nearly upright. The razor-bill is about 15 inches in length, and its wings are sufficiently developed to be used for flight. It is found in numbers on some parts of the British shores, as the Isle of Man.

**AULAP'OLAY, or ALLEPPEY.** A seaport on the south-west coast of

India, Travancore, between the sea and a lagoon, with a safe roadstead all the year round; exports timber, coir, coconuts, etc. Pop. 24,918.

**AULD LICHTS.** *See* PRESBYTERIANISM.

**AULIC** (Lat. *aula*, a court or hall). An epithet given to a council (the *Reichshofrath*) in the old German Empire, one of the two supreme courts of the German Empire, the other being the court of the imperial chamber (*Reichskammergericht*). It had not only concurrent jurisdiction with the latter court, but in many cases exclusive jurisdiction, in all feudal processes, and in criminal affairs, over the immediate feudatories of the Emperor and in affairs which concerned the imperial Government.

**AŬ'LIS.** In ancient Greece, a seaport in Bœotia, on the strait called Euripus, between Bœotia and Eubœa. *See* IPHIGENIA.

**AULLAGAS** (ou-lyä'gäs). A salt lake of Bolivia, which receives the surplus waters of Lake Titicaca through the Rio Desaguadero, and has only one perceptible insignificant outlet, so that what becomes of its superfluous water is still a matter of uncertainty.

**AULNOY** (ō-nwä), **Countess d'.** French writer, born 1650, died 1705, was the author of *Contes des Fées*, (*Fairy Tales*), many of which, such as *The White Cat*, *The Yellow Dwarf*, etc., have been translated into English. She also wrote a number of novels, historical memoirs, etc.

**AUMALE** (ō-mäl). A small French town, department of Seine Inférieure, 35 miles N.E. of Rouen, which has given titles to several notables in French history.—Jean d'Arcourt, Eighth Count d'Aumale, fought at Agincourt, and defeated the English at Gravelle (1423).—Claude II., Duc d'Aumale, one of the chief instigators of the massacre of St. Bartholomew, was killed 1573.—Charles de Lorraine, Duc d'Aumale, was an ardent partisan of the League in the politico-religious French wars of the sixteenth century. — Henri - Eugene - Philippe Louis d'Orleans, Duc d'Aumale, son of Louis Philippe, king of the French, was born in 1822. In 1847 he succeeded Marshal Bugeaud as Governor-General of Algeria, where he had distinguished himself in the war against Abd-el-Kader. After the revolution of 1848 he retired to England; but he returned to France in 1871, and was elected a member of the Assembly; became Inspector-General of the army in 1879, and was expelled along with the other royal princes in 1886, but was allowed to return. Author of a *History of the House of Condé*, etc. He died in 1897.

**AUN'GERVILLE, Richard.** Known as Richard de Bury (from his birthplace Bury St. Edmund's), English statesman, bibliographer, and correspondent of Petrarch, born 1281, died 1345. He entered the order of Benedictine monks, and became tutor to the Prince of Wales, afterwards Edward III. Promoted to several offices of dignity, he ultimately became Bishop of Durham, and Lord Chancellor of England. During his frequent embassies to the Continent he made the acquaintance of many of the eminent men of the day. He was a diligent collector of books, and formed a library at Oxford. Author of *Philobiblon*, printed at Cologne in 1473; *Epistolæ Familiarium*, including letters to Petrarch, etc.

**AURANGABAD'.** A town of India, in the territory of the Nizam of Hyderabad, 175 miles from Bombay. It contains a ruined palace of Aurangzib and a mausoleum erected to the memory of his favourite wife. It was formerly a considerable trading centre, but its commercial importance decreased when Hyderabad became the capital of the Nizam. Pop. 34,000.

**AURANGZIB** ("ornament of the throne"). One of the greatest of the Mogul emperors of Hindustan, born in Oct. 1618 or 1619. When he was nine years old his weak and unfortunate father, Shah Jehan, succeeded to the throne. Aurangzib was distinguished, when a youth, for his serious look, his frequent prayers, his love of solitude, his profound hypocrisy, and his deep plans. In his twentieth year he raised a body of troops by his address and good fortune, and obtained the government of the Deccan. He stirred up dissensions between his brothers, made use of the assistance of one against the other, and finally shut his father up in his harem, where he kept him prisoner. He then murdered his relatives one after the other, and in 1659 ascended the throne.

Notwithstanding the means by which he had got possession of power, he governed with much wisdom. Two of his sons, who endeavoured to form a party in their own favour, he caused to be arrested and put to death by slow poison. He carried on many wars, conquered Golconda and Bijapur, and drove out, by degrees, the Mahrattas from their country. After his death, on 4th March, 1707, the Mogul Empire declined.

**AURANTIA'CEÆ.** The orange tribe, a nat. ord. of plants, poly-

petalous dicotyledons, with leaves containing a fragrant essential oil in transparent dots, and a superior pulpy fruit, originally natives of India; examples comprise the orange, lemon, lime, citron, and shaddock.

**AURAY** (ō-rā). A seaport of North-West France, department Morbihan, with a deaf and dumb institute, and within 2 miles of St. Anne of Auray, a famous place of pilgrimage. Pop. 6653.

**AURE'LIAN. Lucius Domitius Aurelianus.** Emperor of Rome, of humble origin, was born about A.D. 212, rose to the highest rank in the army, and on the death of Claudius II. (270) was chosen emperor. He delivered Italy from the barbarians (Alemanni and Marcomanni), and conquered the famous Zenobia, Queen of Palmyra. He followed up his victories by the reformation of abuses, and the restoration throughout the Empire of order and regularity. He lost his life, A.D. 275, by assassination, when heading an expedition against the Persians.

**AURE'LIUS ANTONI'NUS, Marcus,** often called simply **Marcus Aurelius.** Roman emperor and philosopher, son-in-law, adopted son, and successor of Antoninus Pius, born A.D. 121, succeeded to the throne 161, died 180. His name originally was Marcus Annius Verus. He voluntarily shared the government with Lucius Verus, whom Antoninus Pius had also adopted. Brought up and instructed by Plutarch's nephew, Sextus, the orator Herodes Atticus, and L. Volusius Mecianus, the jurist, he had become acquainted with learned men, and formed a particular love for the Stoic philosophy. A war with Parthia broke out in the year of his accession, and did not terminate till 166. A confederacy of the northern tribes now threatened Italy, while a frightful perstilence, brought from the East with the army, raged in Rome itself. Both emperors set out in person against the rebellious tribes.

In 169 Verus died, and the sole command of the war devolved on Marcus Aurelius, who prosecuted it with the utmost rigour, and nearly exterminated the Marcomanni. His victory over the Quadi (174) is connected with a famous legend. Dion Cassius tells us that the twelfth legion of the Roman army was shut up in a defile, and reduced to great straits for want of water, when a body of Christians enrolled in the legion prayed for relief. Not only was rain sent, which enabled the Romans to quench their thirst, but a fierce storm of hail beat upon the enemy, accompanied by thunder and lightning, which so terrified them that a complete victory was obtained, and the legion was ever after called *The Thundering Legion* (*Legio Fulminatrix*). After this victory the Marcomanni, the Quadi, as well as the rest of the barbarians, sued for peace. The sedition of the Syrian governor Avidius Cassius, with whom Faustina, the empress, was in treasonable communication, called off the emperor from his conquests, but before he reached Asia the rebel was assassinated.

Aurelius returned to Rome, after visiting Egypt and Greece, but soon new incursions of the Marcomanni compelled him once more to take the field. He defeated the enemy several times, but was taken sick at Sirmium, and died at Vindobona (Vienna) in 180.

His only extant work is the *Meditations*, written in Greek. It has been translated into most modern languages (into English first by George Long in 1862, and by J. Jackson in 1906). This may be regarded as a manual of practical morality, in which wisdom, gentleness, and benevolence are combined in the most fascinating manner. Many believe it to have been intended for the instruction of his son Commodus. Aurelius was one of the best emperors Rome ever saw, although his philosophy and the magnanimity of his character did not restrain him from the persecution of the Christians, whose religious doctrines he was led to believe were subversive of good government, and whom he charged, therefore, with obstinacy, the greatest social crime in the eyes of Roman authority. Marcus Aurelius was not so much a philosopher as a seeker after righteousness.—BIBLIOGRAPHY: P. B. Watson, *M. Aurelius Antoninus*; Sir Samuel Dill, *Roman Society from Nero to Marcus Aurelius*; Translations of the *Meditations* by G. H. Rendall, and J. Jackson.

**AURENGZEBE.** *See* AURANGZIB.

**AURE'OLA,** or **AU'REOLE.** In paintings, an illumination surrounding the whole figure of a holy person, as Christ, a saint, or a martyr, intended to represent a luminous cloud or haze emanating from him. It is generally of an oval shape, or may be nearly or quite circular, and is of similar character with the nimbus surrounding the heads of sacred personages.

**AU'RÉUS.** The first gold coin which was coined at Rome, 207 B.C. Its value varied at different times, from about 12*s.* to £1, 4*s.* *See* NUMISMATICS.

**AURICH** (ou'rĕh). A German town, province of Hanover. Pop. 6070.

**AU'RICLE.** *See* HEART.

**AURIC'ULA.** A garden flower derived from the yellow *Primŭla Auricŭla*, found native in the Swiss Alps, and sometimes called bear's-ear from the shape of its leaves. It has for over three centuries been an object of cultivation by florists, who have succeeded in raising from seed a great number of beautiful varieties. Its leaves are obovate, entire or serrated, and fleshy, varying, however, in form in the numerous varieties. The flowers are borne on an erect umbel and central scape with involucre. The original colours of the corolla are yellow, purple, and variegated, and there is a mealy covering on the surface. There are auricula clubs and societies in the north of England.

**AURICULAR CONFESSION.** *See* CONFESSION.

**AU'RIFABER.** The Latinized name of Johann Goldschmidt, one of Luther's companions, born 1519, became pastor at Erfurt in 1566, died there in 1579. He collected the unpublished MSS. of Luther, and edited the *Epistolæ* and the *Table-talk*.

**AURIFLAMME.** *See* ORIFLAMME.

**AURI'GA.** In astronomy, the *Waggoner*, a constellation of the northern hemisphere, containing Capella, a star of the first magnitude. *Nova Aurigæ*, a temporary star, appeared in the constellation in 1892.

**AURILLAC** (ō-rē-yák). A town of France, capital of the department Cantal, in a valley watered by the Jordanne, about 270 miles S. of Paris; well built, with wide streets; copper-works, paper-works, manufactures of lace, tapestry, leather, etc. Pop. 18,036.

**AUROCHS** (ą'roks). A species of wild bull or buffalo, the *urus* of Cæsar, *bison* of Pliny, the European bison, *Bos* or *Bonassus Bison* of modern naturalists. The animal was once abundant in Europe, but were it not for the protection afforded by the late Emperor of Russia to a few herds which inhabit the forests of Lithuania it would before this have been extinct.

**AURO'RA.** An American city, of Kane county, Illinois, on Fox River, 40 miles W. by S. of Chicago; it has flourishing manufactures, railway-works, and a considerable trade. Pop. (1920), 36,265.

**AURO'RA** (Gr. *Ēōs*). In classical mythology, the goddess of the dawn, daughter of Hyperion and Theia, and sister of Helios and Selēnē (Sun and Moon). She was represented as a charming figure, "rosy-fingered," clad in a yellow robe, rising at dawn from the ocean and driving her chariot through the heavens. Among the mortals whose beauty captivated the goddess, poets mentioned Orion, Tithōnus, and Cephălus.

**AURO'RA.** One of the New Hebrides Islands, S. Pacific Ocean, about 30 miles long by 5 wide. It rises to a considerable elevation, and is covered with a luxuriant vegetation.

**AURO'RA BOREA'LIS.** A luminous meteoric phenomenon appearing in the north, most frequently in high

Aurora Borealis

latitudes, the corresponding phenomenon in the southern hemisphere being called *Aurora Australis*, and both being also called *Polar Light*, *Streamers*, etc. The northern aurora has been far the most observed and studied. It usually manifests itself by streams of light ascending towards the zenith from a dusky line of cloud or haze a few degrees above the horizon, and stretching from the north towards the west and east, so as to form an arc with its ends on the horizon, and its different parts and

rays are constantly in motion. Sometimes it appears in detached places; at other times it almost covers the whole sky. It assumes many shapes and a variety of colours, from a pale red or yellow to a deep red or blood colour; and in far northern latitudes serves to illuminate the earth and cheer the gloom of the long winter nights.

The appearance of the aurora borealis so exactly resembles the effects of experimental electrical phenomena that there is every reason to believe that their causes are similar. When electricity passes through rarefied air it exhibits a diffused luminous stream which has all the characteristic appearances of the aurora, and hence it is highly probable that this natural phenomenon is occasioned by the passage of electricity through the upper regions of the atmosphere. The synchronism of auroral display with disturbances of the magnetic needle is an ascertained fact, and the connection between aurorae and magnetism is further evident from the fact that the beams or coruscations issuing from a point in the horizon west of north are frequently observed to run in the magnetic meridian. What are known as magnetic storms are invariably connected with exhibitions of the aurora, and with spontaneous galvanic currents in the ordinary telegraph wires; and this connection is found to be so certain that, upon remarking the display of one of the three classes of phenomena, we can at once assert that the other two are also present.

In recent years it has been established that aurorae wax and wane in frequency *pari passu* with sun-spots in an 11-year cycle, and that they often manifest themselves about the time of transit of a conspicuous spot across the sun's central meridian. Also they frequently recur at successive intervals of about 27 days, which is the period of a solar rotation relative to the earth. It is therefore inferred that aurorae are largely excited by influences proceeding from the sun, and it is suggested that they are the result of the impinging upon our upper atmosphere of streams of electric corpuscles expelled from the solar orb, these streams when approaching our planet being mainly directed to its higher latitudes as a consequence of its magnetic polarity.

The aurora borealis is said to be frequently accompanied by sound, which is variously described as resembling the rustling of pieces of silk against each other, or the sound of wind against the flame of a candle. The aurora of the southern hemisphere is quite a similar phenomenon to that of the north.

Since about 1912 much attention has been given to the spectrum of the aurora. Lord Rayleigh, Slipher, and Vegard have shown that the element responsible for a large proportion of the spectrum is nitrogen. Vegard holds that the prominent green line arises from nitrogen snow, when bombarded by corpuscular radiation from the sun. McLennan, however, regards the green line as due to oxygen.—BIBLIOGRAPHY: A. Angot, *Les Aurores Polaires*; Captain H. P. Dawson, *Observations of the International Polar Expeditions*, 1882-3, *Fort Rae*.

**AURUNGABAD.** *See* AURANGABAD.

**AURUNGZEBE.** *See* AURANGZIB.

**AUSCULTA'TION.** A method of distinguishing the state of the internal parts of the body, particularly of the thorax and abdomen, by observing the sounds arising in the part either through the immediate application of the ear to its surface (immediate auscultation), or by applying the stethoscope to the part and listening through it (mediate auscultation). Auscultation may be used with more or less advantage in all cases where morbid sounds are produced, but its general applications are: the *auscultation* of respiration, the *auscultation* of the voice; *auscultation* of coughs; *auscultation* of sounds foreign to all these, but sometimes accompanying them; *auscultation* of the actions of the heart; obstetric *auscultation*. The parts when struck also give different sounds in health and disease.

**AUSO'NIA.** An ancient poetical name of Italy.

**AUSO'NIUS, Decimus Magnus** (c. A.D. 310-395). Roman poet, born at Burdigala (Bordeaux). Valentinian entrusted to him the education of his son Gratian, and appointed him afterwards quæstor and pretorian prefect. Gratian appointed him consul in Gaul, and after this emperor's death he lived upon an estate at Bordeaux, devoted to literary pursuits. He wrote epigrams, idyls, ecologues, letters in verse, etc., still extant, and was probably a Christian. He was rather a man of letters than a poet, and his poems are devoid of inspiration.

**AUSPICES.** Among the ancient Romans strictly omens or auguries derived from birds, though the term was also used in a wider sense. Nothing of importance was done

without taking the auspices, which, however, simply showed whether the enterprise was likely to result successfully or not, without supplying any further information. Magistrates possessed the right of taking the auspices, in which they were usually assisted by an augur. Before a war or campaign a Roman general always took the auspices, and hence the operations were said to be carried out "under his auspices." *See* AUGUR.

**AUS'SIG.** A town in Bohemia, in the republic of Czechoslovakia, formerly in Austria, near the junction of the Bila with the Elbe, 42 miles N.N.W. of Prague; has large manufactures of woollens, chemicals, etc. The town is now known as Usti nad Labem. Pop. 40,000.

**AUS'TEN, Jane.** English novelist, born 1775, at Steventon, in Hants, of which parish her father was rector. Her principal novels are *Sense and Sensibility*; *Pride and Prejudice*, which Disraeli is said to have read seventeen times; *Mansfield Park*; and *Emma*. Two more were published after her death, entitled *Northanger Abbey* and *Persuasion*, which were, however, her most early attempts. Her novels are marked by ease, humour, and a complete knowledge of the domestic life of the English middle classes of her time. She died in 1817.

**AUSTENITE.** A constituent of high-carbon steel (q.v.).

**AUS'TERLITZ.** A town with 3703 inhabitants, in Moravia, 10 miles E. of Brünn, famous for the battle of 2nd Dec., 1805, fought between the French (70,000 in number) and the allied Austrian and Russian armies (95,000). The decisive victory of the French led to the Peace of Pressburg between France and Austria.

**AUS'TIN.** Capital of the State of Texas, on the Colorado, about 200 miles from its mouth, and accessible to steamboats during certain seasons. There is a State university and other institutions, and a splendid capitol built of red granite. Pop. (1920), 34,876.

**AUS'TIN, Alfred.** English poet, born at Hedingley, near Leeds, in 1835, educated at Stonyhurst and St. Mary's College, Oscott; took the degree of B.A. at London in 1853, was called to the Bar and practised, but gave up law for literature in 1861. He published, in 1861, a satire called *The Season*, followed by many poems, including *The Human Tragedy*, *The Golden Age*, *Savonarola* (a tragedy), *English Lyrics*, *Fortunatus the Pessimist*, *Lyrical Poems*, *Narrative Poems*, *Prince Lucifer*, *Alfred the Great*, *A Tale of True Love*, *Flodden Field* (a tragedy), etc. His works in prose include *The Garden that I love*, *In Veronica's Garden*, *Spring and Autumn in Ireland*, *Haunts of Ancient Peace*, *The Bridling of Pegasus*, etc. He was made Poet Laureate in 1896, about four years after the death of Tennyson. He died in 1913.

**AUSTIN, John.** An English writer on jurisprudence, born 1790, died 1859. From 1826 to 1835 he filled the chair of jurisprudence at London University. He served on several royal commissions, one of which took him to Malta; lived for some years on the Continent, and finally settled at Weybridge, in Surrey. His fame rests solely on his great works: *The Province of Jurisprudence Determined*, published in 1832; and his *Lectures on Jurisprudence*, published by his widow between 1861 and 1863.—His wife, Sarah, one of the Taylors of Norwich, produced translations of German works, and other books bearing on Germany or its literature; also, *Considerations on National Education*, etc. Born 1793, died 1867. Her daughter, Lady Duff Gordon, translated Meinhold's *Mary Schweidler, the Amber Witch*, and other German works.

**AUSTIN, Sir Herbert.** English manufacturer. Born at Little Missenden, Bucks., Nov. 8, 1866. Educated as an engineer. He lived in Australia for a few years, but in 1890 returned to England and became connected with a firm making machinery for sheep shearing. Attracted by the possibilities of the motor car he started in business for himself at Northfield, Birmingham, in 1890. In a few years he was one of the largest makers of motor cars in the country. He was specially successful with the small cars known everywhere as "baby Austins." From 1919 to 1924 Austin, who was knighted in 1917, was M.P. for the King's Norton division of Birmingham.

**AUSTIN, St.** *See* AUGUSTINE.

**AUSTIN FRIARS.** *See* AUGUSTINS.

**AUSTRALASIA.** A division of the globe usually regarded as comprehending the Islands of Australia, Tasmania, New Zealand, New Caledonia, the New Hebrides, the Solomon Islands, New Ireland, New Britain, the Admiralty Islands, New Guinea, and the Arru Islands, besides numerous other islands and island groups; estimated area, 3,400,000 sq. miles; pop. 8,000,000. It forms

one of the three portions into which some geographers have divided Oceania, the other two being Malaysia and Polynesia. The British territories in Australasia comprise the Commonwealth of Australia, the Australian dependencies of Papua and Northern Territory, New Zealand, the crown colony of Fiji, and various island groups.

**AUSTRALIA** (older name, **NEW HOLLAND**). The largest island in the world, a sea-girt continent, lying between the Indian and Pacific Oceans, S.E. of Asia. It is separated from New Guinea on the north by Torres Strait, from Tasmania on the south by Bass Strait. It is divided into two unequal parts by the Tropic of Capricorn, and consequently belongs partly to the South Temperate, partly to the Torrid Zone. In 1901 Tasmania and the five British colonies (now known as states) New South Wales, Victoria, Queensland, South Australia, and Western Australia were united to form the Commonwealth of Australia. At that time the Northern Territory was administered by South Australia, but it is now under the Federal Government, and in 1927 was divided into North Australia and Central Australia. They were again united in 1931. The area and population are as follows :—

| State. | Area in sq. miles. | Population, 1931. |
|---|---|---|
| New South Wales | 309,432 | 2,507,055 |
| Victoria.. .. | 87,884 | 1 797,459 |
| Queensland .. | 670,500 | 959,572 |
| South Australia | 380,070 | 583,588 |
| Western Australia | 975,920 | 420,616 |
| Tasmania .. | 26,215 | 219,133 |
| North Australia | 287,227 | 4,654 |
| Central Australia | 236,393 | |
| Federal Territory | 940 | 8,459 |
| | 2,974,581 | 6,500,536 |

Sydney, Melbourne, Adelaide, Brisbane, Perth, and Hobart (Tasmania) are the chief towns.

**Physical features.** Although there are numerous spacious harbours on the coasts, there are few remarkable indentations, the principal being the Gulf of Carpentaria, on the N., the Great Australian Bight, and Spencer's Gulf, on the S. The chief projections are Cape York Peninsula and Arnhem Land in the north. Parallel to the N.E. coast runs the Great Barrier Reef for 1000 miles. In great part the E. coast is bold and rocky, and is fringed with many small islands. Part of the S. coast is low and sandy, and part presents cliffs of several hundred feet high. The N. and W. coasts are generally low, with some elevations at intervals.

The interior, so far as explored, is largely composed of rocky tracts and barren plains with little or no water. The whole continent forms an immense plateau, highest in the east, low in the centre, and with a narrow tract of land usually intervening between the elevated area and the sea. The base of the table-land is granite, which forms the surface-rock in a great part of the south-west, and is common in the higher grounds along the east side. Secondary (cretaceous) and tertiary rocks are largely developed in the interior. Silurian rocks occupy a large area in South Australia, on both sides of Spencer Gulf. The mountainous region in the south-east and east is mainly composed of volcanic, Silurian, carbonaceous, and carboniferous rocks yielding good coal. No active volcano is known to exist, but in the south-east there are some craters only recently extinct. The highest and most extensive mountain-system is a belt about 150 miles wide skirting the whole eastern and south-eastern border of the continent, and often called, in whole or in part, the Great Dividing Range, from forming the great water-shed of Australia. A part of it, called the Australian Alps, in the south-east contains the highest summits in Australia, Mount Kosciusko (7175 feet), Mount Clarke (7256 feet), and Mount Townshend (7353 feet). West of the Dividing Range are extensive plains or downs admirably adapted for pastoral purposes. The deserts and scrubs, which occupy large areas of the interior, are a characteristic feature of Australia. The former are destitute of vegetation, or are covered only with a coarse, spiny grass that affords no sustenance to cattle or horses; the latter are composed of a dense growth of shrubs and low trees, often impenetrable till the traveller has cleared a track with his axe.

The rivers of Australia are nearly all subject to great irregularities in volume, many of them at one time showing a channel in which there is merely a series of pools, while at another they inundate the whole adjacent country. The chief is the Murray, which, with its affluents the Murrumbidgee, Lachlan, and Darling, drains a great part of the interior west of the Dividing Range, and falls into the sea on the south coast (after entering Lake Alexandrina). Its greatest tributary is the Darling, which may even be regarded as the main stream. On the east coast are the

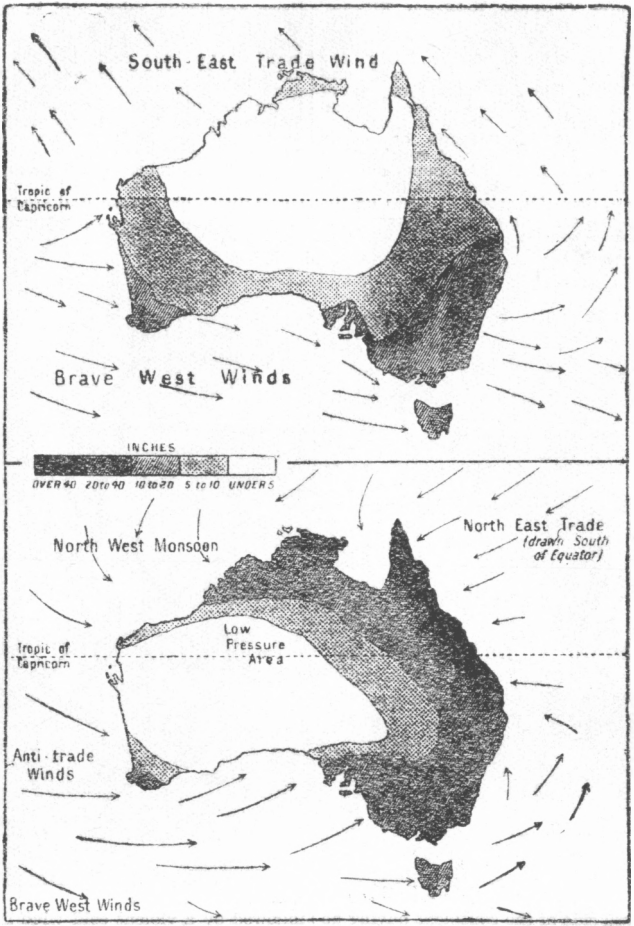
Hunter, Clarence, Brisbane, Fitzroy, and Burdekin; on the west, the Swan, Murchison, Gascoyne, Ashburton, and De Grey; on the north, the Fitzroy, Victoria, Flinders, and Mitchell. The Australian rivers are of little service in facilitating internal communication. Many of them lose themselves in swamps or sandy wastes of the interior. A considerable river of the interior is Cooper's Creek, or the Barcoo, which falls into Lake Eyre, one of a group of lakes on the

Physical Features of Australia, and the Chief Railways

south side of the continent having no outlet, and accordingly salt. The principal of these are Lakes Eyre, Torrens, and Gairdner, all of which vary in size and saltness according to the season. Another large salt lake of little depth, Lake Amadeus, lies a little west of the centre of Australia. Various others of less magnitude are scattered over the interior.

**Climate.** The climate of Australia is generally hot and dry, but very healthy. In the tropical portions there are heavy rains, and in most of the coast districts there is a sufficiency of moisture, but in the interior the heat and drought are extreme. Considerable portions now devoted to pasturage are liable at times to suffer from drought. At Melbourne the mean temperature is about 56°, at Sydney about 63°. The south-eastern settled districts are at times subject to excessively hot winds from the interior, which cause great discomfort, and are often followed by a violent cold wind from the south ("southerly busters"). In the mountainous and more temperate parts snow-storms are common in winter (June, July, and August).

**Minerals.** Australia is a region containing a vast quantity of mineral wealth. Foremost come its rich and extensive deposits of gold, which, since the precious metal was first discovered in 1851, have produced a total of nearly £630,000,000. The greatest quantity has been obtained



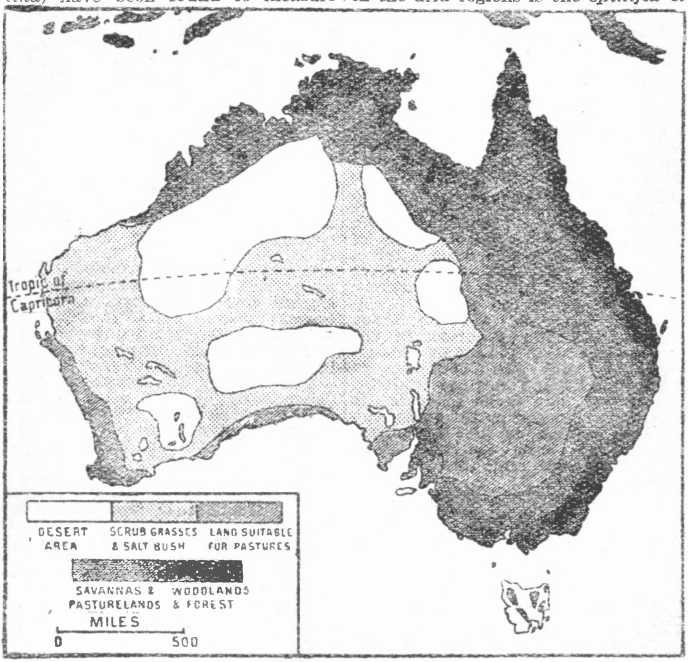

Winds and Rainfall in Australia. Top—July. Bottom—January

in Victoria, but New South Wales and Queensland have also yielded a considerable amount, and now Western Australia stands first in respect of annual output. Australia also possesses silver, copper, tin, lead, zinc, antimony, mercury, plumbago, etc., besides coal (now worked to a considerable extent in New South Wales) and iron. Various precious stones are found, as the garnet, ruby, topaz, sapphire, and even the diamond. Of building-stone there are granite, limestone, marble, and sandstone.

**Flora.** The Australian flora presents peculiarities which mark it off by itself in a very decided manner. Many of its most striking features have an unmistakable relation to the general dryness of the climate. The trees and bushes have for the most part a scanty foliage, presenting little surface for evaporation, or thick

leathery leaves well fitted to retain moisture. The most widely-spread types of Australian vegetation are the various kinds of gum tree (*Eucalyptus*), the shea-oak (*Casuarina*), the acacia or wattle, the grass tree (*Xanthorrhœa*), many varieties of Proteaceæ, and a great number of ferns and tree-ferns. Of the gum tree there are found upwards of 150 species, many of which are of great value. Individual specimens of the "peppermint" (*E. amygdalina*) have been found to measure adorned with rich masses of fragrant yellow blossom. Palms—of which there are twenty-four species, all except the coco-palm peculiar to Australia—are confined to the north and east coasts. In the "scrubs" already mentioned hosts of densely-intertwisted bushes occupy extensive areas. The *mallee* scrub is formed by a species of dwarf eucalyptus, the *mulga* scrub by a species of thorny acacia.

A plant which covers large areas in the arid regions is the *spinifex* or




Typical Vegetation Areas of Australia

from 480 to 500 feet in height. As timber trees the most valuable members of this genus are the *E. rostrāta* (or red gum), *E. leucoxȳlon*, and *E. marginātа* (jarrah), the timber of which is hard, and almost indestructible. A number of the gum trees have deciduous bark. The wattle or acacia includes about 300 species, some of them of considerable economic value, yielding good timber or bark for tanning. The most beautiful and most useful is that known as the golden wattle (*A. dealbāta*), which in spring is

porcupine grass, a hard, coarse, and excessively spiny plant, which renders travelling difficult, wounds the feet of horses, and is utterly uneatable by any animal. Other large tracts are occupied by herbs or bushes of a more valuable kind, from their affording fodder. Foremost among those stands the salt-bush (*Atriplex nummularia*, ord. Chenopodiaceæ). Beautiful flowering plants are numerous. Australia also possesses great numbers of turf-forming grasses, such as the kangaroo-grass (*Anthistiria australīis*), which survives even

a tolerably-protracted drought. The native fruit trees are few and unimportant, and the same may be said of the plants yielding roots used as food; but exotic fruits and vegetables may now be had in the different states in great abundance and of excellent quality. The vine, the olive, and mulberry thrive well, and quantities of wine are now produced. The cereals of Europe and maize are extensively cultivated, and large tracts of country, particularly in Queensland, are under the sugar-cane.

**Fauna.** The Australian fauna is almost unique in its character. Its great feature is the nearly total absence of all the forms of mammalia which abound in the rest of the world, their place being supplied by a great variety of marsupials—these animals being nowhere else found, except in the opossums of America. There are about 110 kinds of marsupials (of which the kangaroo, wombat, bandicoot, and phalangers or opossums are the best-known varieties), over twenty kinds of bats, a wild dog (the dingo), and a number of rats and mice. Two extraordinary animals, the platypus, or water-mole of the colonist (Ornithorhynchus), and the porcupine ant-eater (Echidna) constitute the lowest order of mammals (Monotremata), and are confined to Australia. Their young are produced from eggs. The breed of horses is excellent. Horned cattle and sheep are largely bred, the first attaining a great size, while the sheep improve in fleece and their flesh in flavour.

There are upwards of 650 different species of birds, the largest being the emu, or Australian ostrich, and a species of cassowary. Peculiar to the country are the black swan, the honey-sucker, the lyre-bird, the brush-turkey, and other mound-building birds, the bower-birds, etc. The parrot tribe preponderates over most other groups of birds in the continent.

There are many reptiles, the largest being the alligator, found in some of the northern rivers. There are upwards of sixty different species of snakes, some of which are very venomous. Lizards, frogs, and insects are also numerous in various parts. The seas, rivers, and lagoons abound in fish of numerous varieties, and other aquatic animals, many of them peculiar. Whales and seals frequent the coasts. On the northern coasts are extensive fisheries of trepang, much visited by native traders from the Indian Archipelago. Some animals of European origin, such as the rabbit and the sparrow, have developed into pests.

**People.** The natives belong to the Australian negro stock, and are sometimes considered the lowest as regards intelligence in the whole human family, though this is doubtful. They are estimated to number about 60,000. They are of a dark-brown or black colour, with jet-black curly but not woolly hair, of medium size, but inferior muscular development. In the settled parts of the continent they are inoffensive, and rapidly dying out. They have no fixed habitations; in the summer they live almost entirely in the open air, and in the more inclement weather they shelter themselves with bark erections of the rudest construction. They have no cultivation and no domestic animals. Their food consists of such animals as they can kill, and no kind of living creature seems to be rejected, snakes, lizards, frogs, and even insects being eaten, often half raw. They are ignorant of the potter's art. In their natural condition they wear little or no clothing. They speak a number of different languages or dialects. The weapons of all the tribes are generally similar, consisting of spears, shields, boomerangs, wooden axes, clubs, and stone hatchets. Of these the boomerang is the most singular, being an invention confined to the Australians.

**Constitution.** The five colonies, independently of each other, having declared their desire for a federal union, the Commonwealth of Australia was proclaimed. A Convention, which sat at Adelaide in 1897-8, drafted a Constitution Bill, and on 9th July, 1900, the British Parliament passed the Act to constitute the Commonwealth. There is now a Governor-General and Central or Federal Parliament, consisting of a Senate and a House of Representatives, while each State has also a Governor and a Parliament of its own. Each Parliament consists of two Houses corresponding to the British House of Lords and House of Commons, but both Houses are elected by popular vote. All these governing bodies are modelled on that of the home country. The Federal Government, besides its other duties, administers the Northern Territory (i.e. North Australia and Central Australia) and the Federal Territory round Canberra (q.v.) and Jervis Bay (q.v.). There is a Citizen Army, training in which was compulsory till 1929, and a navy—the Royal Australian Navy. There is a Royal Australian Air Force. Education is well looked after, and is secular, free, and compulsory throughout the Com-

monwealth. There are universities at Melbourne, Sydney, Adelaide, Brisbane, Perth and Hobart.

In 1931 the total imports were valued at £60,558,095, and the exports at £88,811,000. The following tables show the various industries of the Commonwealth and the value of its products :

| Commodity. | Where produced. | Value exported in 1930-1. |
|---|---|---|
| Wool | All states. Australia has over 100,000,000 sheep | £52,003,305 |
| Wheat | All states near coast. Very little in Queensland | 14,613,063 |
| Flour | All states | 3,611,629 |
| Meats of all kinds | All states. Australia has 13,000,000 cattle | 5,719,125 |
| Butter and dairy products | Broad coastal strip from east of Cape York Peninsula to Adelaide and in territory west of a line joining Albany and Perth | 8,974,977 |
| Fruits, dried and fresh, and wine | In same area as dairy produce. Wine industry requires development | 4,361,269 |
| Hides and skins | All states | 3,636,954 |
| Minerals | All states | 18,020,235 |
| Timber | Queensland, N.S.W., Victoria, S.W. corner of W. Australia | 765,000 |
| Cotton | A developing industry, at present confined to Queensland and N.S.W. | — |

| Total Products. | Value 1930-31. |
|---|---|
| Agriculture | £70,500,000 |
| Pastoral | 69,499,000 |
| Dairying, poultry, and bee farming | 43,067,000 |
| Forests and fisheries | 5,313,000 |
| Mining | 15 400,000 |
| Manufacturing | 112,966,000 |
| Total | £319,745,000 |

**Railways.** There are about 28,000 miles of railway track, 26,605 belonging to the Government. A transcontinental line has been laid down from Adelaide to Oodnadata, and its further extension to Port Darwin was commenced early in 1927. A trans-Australian railway runs from Perth through Kalgoorlie to Adelaide. The coinage is the same as in the United Kingdom, and there are mints at Sydney, Melbourne, and Perth.

**History.** It is doubtful when Australia was first discovered by Europeans. Between 1531 and 1542 the Portuguese published the existence of a land which they called Great Java, and which corresponded to Australia, and probably the first discovery of the country was made by them early in the sixteenth century. The first authenticated discovery is said to have been made in 1601 by a Portuguese named Manoel Godinho de Eredia. In 1606 Torres, a Spaniard, passed through the strait that now bears his name, between New Guinea and Australia. Between this period and 1628 a large portion of the coastline of Australia had been surveyed by various Dutch navigators. In 1664 the continent was named New Holland by the Dutch Government. In 1688 Dampier coasted along part of Australia, and about 1700 explored a part of the W. and N.W. coasts.

In 1770 Cook carefully surveyed the E. coast, named a number of localities, and took possession of the country for Britain. He was followed by Bligh in 1789, who carried on a series of observations on the N.E. coast, adding largely to the knowledge already obtained of this new world. Colonists had now arrived on the soil, and a penal settlement was formed (1788) at Port Jackson. In this way was laid the foundation of the future colony of New South Wales. The Moreton Bay district (Queensland) was settled in 1825; in 1835 the Port Phillip district. In 1851 the latter district was erected into a separate colony under the name of Victoria. Previous to this time the colonies both of Western Australia and of South Australia had been founded—the former in 1829, the latter in 1836. The latest of the colonies is Queensland, which dates from 1859.

The discovery of gold in abundance took place in 1851 and caused an immense excitement and great influx of immigrants. The population was then only about 350,000, and was

slowly increasing; but the discovery of the precious metal started the country on that career of prosperity which has since been almost uninterrupted. Convicts were long sent to Australia from the mother country, but transportation to New South Wales practically ceased in 1840, and the last convict vessel to W. Australia arrived in 1868. Altogether about 70,000 convicts were landed in Australia (besides almost as many in Tasmania).

**Exploration.** The record of interior exploration forms an interesting part of Australian history. This has been going on since early last century, and is as yet far from complete. There is still a large area of the continent of which little or nothing is known, comprising especially a vast territory belonging to Western Australia, and a portion of South Australia.

Among the men who have won fame in the field of Australian exploration are Oxley (1817-23), who partly explored the Lachlan and Macquarie, discovered the Brisbane, etc.; Hume and Hovell (1824) who crossed what is now the colony of Victoria from north to south; Cunningham (1827), who discovered the Darling Downs; Sturt (1828-9), who examined the Macquarie, part of the Darling, and the Murrumbidgee, which he traced to the Murray, sailing down the latter to Lake Alexandrina; in 1844 he penetrated to near the middle of the continent from the south; Mitchell (1831-6) made exteusive explorations in New South Wales and Victoria; M'Millan (1839) explored and traversed Gippsland; Eyre (1840) travelled by the coast from Adelaide to King George's Sound; Leichhardt in 1844-5 travelled from Brisbane to Port Essington, discovering fine tracts of territory and the numerous rivers flowing into the Gulf of Carpentaria; in 1848 he was lost in the northern interior, in attempting to cross Australia from east to west, and nothing further regarding his fate has been discovered; Kennedy (1848) was killed in exploring Cape York Peninsula; A. C. Gregory (1855-6) explored part of North-Western Australia, and crossed from that to the Brisbane district, an important exploring journey; M'Douall Stuart (1858-60-2) crossed the continent from south to north and back again nearly

The Railways of the Australian States

in the line of the present overland telegraph; Burke, Wills, Gray, and King (1860-1) crossed from Melbourne to the Gulf of Carpentaria, but Burke, Wills, and Gray perished on the return journey; F. T. Gregory (1861) explored the region of the Ashburton, Fortesque, and other rivers of North-West Australia; Warburton (1873) travelled with camels from the centre of the continent to the north-west coast; J. Forrest (1874) made an important journey in Western Australia; Giles (1874-6) explored Central Western Australia; Favenc (1878-9) travelled from Brisbane to Port Darwin; A. Forrest (1879) explored part of Northern Australia; Mills (1883) traversed with camels a considerable stretch of new ground in Western Australia; Winnicke (1883-4), also with camels, explored and mapped about 40,000 sq. miles of the unknown interior; Lindsay (1885-6) travelled north-west from Lake Eyre, and then north-east to the Gulf of Carpentaria. Among subsequent explorations mention may be made of Carnegie's eight months' journeyings in W. Australia (1896-7). (See articles on the separate states.)—

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**AUSTRA'LOIDS.** One of the five groups into which Professor Huxley classifies man, comprising the indigenous non-Aryan inhabitants of Central and Southern India, the ancient Egyptians and their descendants, and the modern Fellahs.

**AUSTRIA.** One of the states formed in 1918 out of the old Austro-Hungarian Empire. It is a federal republic consisting of eight provinces and the city of Vienna.

**Constitution.** A National Assembly elected in 1918 appointed a temporary cabinet and passed such laws as were necessary, and early in 1919 the inhabitants of the country elected a National Constitutional Assembly. This body drew up a Constitution which came into force in 1920. The federal legistative and administrative power is in the hands of the *Nationalrat* or Assembly, which is elected by popular vote. There is also a *Bundesrat* or First Chamber chosen by the Provincial Diets, but it is only an advisory body. The President of the republic is chosen by both houses in common session. Each province has a *Landtag* or Provincial Assembly, which appoints a *Landesausschuss* or Provincial Committee. The following table shows the provinces, area, and population of Austria:

| Provinces. | Area in sq. miles. | Pop. 1931. |
|---|---|---|
| Vienna .. .. | 107 | 1,865,789 |
| Burgenland .. | 1,532 | 300,294 |
| Lower Austria .. | 7,452 | 1,493,293 |
| Upper Austria .. | 4,636 | 918,006 |
| Salzburg .. | 2,762 | 237,384 |
| Styria .. .. | 6,323 | 1,025,475 |
| Carinthia .. | 3,680 | 403,722 |
| Tyrol .. .. | 4,882 | 338,491 |
| Vorarlberg .. | 1,005 | 150,231 |
| Totals .. | 32,369 | 6,732,625 |

**Physical Features.** The boundaries of Austria, as fixed by the Treaty of St. Germain (1919) and the Treaty of Trianon (1920), are Germany and Czechoslovakia on the north, Italy and Yugoslavia on the south, Switzerland on the west, and Hungary on the east. Austria is almost entirely mountainous. The Rhætian and the Noric Alps run almost due east from Switzerland (Gross Glockner, 12,461 feet) and gradually fall towards the Hungarian plain and the Danube basin. The north-east portion of Austria is traversed by the Danube, so that, except for Vorarlberg, the whole country lies within the Danube basin. The tributaries of this river are the Inn, Enns, March, Raab, and Drava. Of these the Danube and the March are international water-ways, and the Inn is also navigable. Austria has no sea-coast, but she has been granted the right of transit on the Lower Danube and on the railways to Fiume and Trieste.

**Products and Minerals.** By far the chief occupation of the country is agriculture, and the principal crops are rye, oats, wheat, barley, and potatoes. The acreage of arable land is, however, comparatively small, and Austria does not produce sufficient for her own needs. Forests abound, and there is a large export of timber and other forest products. Minerals are worked, and lignite, anthracite, iron, copper, zinc, lead, and salt are all produced in considerable quantities, but here again production does not at present cover home consumption. The result is that economically Austria is dependent on neighbouring countries for cereals, coal, and iron, for which she can only pay by manufactured articles.

**Manufactures.** There are several very important manufacturing industries, such as piano-making, and the manufacture of motor-cars, textiles, and furniture, and, in recent years, sports knitted goods and hosiery have been largely exported.

But these industries are part of a vicious circle, for they are hampered by lack of coal.

In any case, the quality of Austrian goods, though high enough, it not outstanding, and for several years after the European War memories of the monarchy still survived to make surrounding countries none too keen to do business with Austria. The result of this was economic and financial chaos and imminent danger of national bankruptcy. The situation was tackled by the League of Nations, and as a result the finances of the country were placed on a sound basis, and the national credit was restored. Trade with surrounding countries was resumed, and there is now a considerable export of magnesite from Styria and Carinthia, of salt from Salzburg and Tyrol, and of manufactured goods, including cotton from Vorarlberg, iron and machinery from Styria, and wood-work and paper from the forest areas. The total value of exports in 1927 was £38,800,000, and of imports £64,000,000. Trade is mainly with Czechoslovakia, Germany, Hungary, and Poland. The currency unit has been since 1925 the gold *schilling* of 100 *groschen*, which has a par value of 6.9*d*. (34.58 schillings = £1 sterling).

Vienna, which was formerly the centre of Central and Eastern European trade and commerce, lost much of its influence during and after the European War. For a time, indeed, it lost its pre-eminence and became a city of poverty and distress, but since the stabilization of the Austrian finances it has again become the most important commercial centre in South-Eastern Europe. Prague and Budapest have, however, captured much of her trade. There are in Austria about 4154 miles of railway track, 3600 miles of which are State-owned. There is also a State-subsidized aviation company, which maintains a regular service, Vienna-Salzburg-Innsbruck, and Innsbruck-Constance.

**Education.** Religious liberty is one of the fundamental laws of the Austrian Republic, but the great majority of the inhabitants are Roman Catholics. Education is well cared for, and attendance at elementary schools between the ages of 6 and 14 is compulsory. For secondary education there are Gymnasia, Realschulen, German Middle Schools, and Girls' Middle Schools (or Mädchenlyzeen). There are eight Commercial Academies, of which the State maintains one in Graz, while private individuals control four in Vienna, one at Linz, one at Klagenfurt, and one at Innsbruck. The State has three universities (at Vienna, Graz, and Innsbruck) and two technical high schools (at Vienna and Graz). There is a theological high school at Salzburg, and there are twelve other theological colleges (ten being Roman Catholic), while there are thirty-seven training colleges for teachers, and various high schools for agriculture, veterinary science, mining, art, and music.

By the Treaty of St. Germain the fighting forces and equipment of Austria are strictly limited. The total strength of the army may not exceed 30,000 men of all ranks, and no scheme of compulsory service is allowable. Educational establishments, sporting clubs, and all similar bodies are prohibited from engaging in military matters. Austria possesses no air force, and the manufacture of aircraft is forbidden. The only naval force consists of four small patrol vessels on the Danube.

For the history of Austria, and of the Austro-Hungarian Empire, it is necessary to consult the article AUSTRIA-HUNGARY. It should be remembered that nine-tenths of the inhabitants of the country are of German extraction, and that the State is therefore held together by a race sentiment such as never existed in the days of the Empire.—BIBLIOGRAPHY: *Treaty of Peace between the Allied and Associated Powers and Austria*; Paul Franck, *La Reconstruction financière de l'Autriche*; Henry Hajnol, *The Danube: Its Historical, Political, and Economic Importance*; C. A. Macartney, *The Social Revolution in Austria*; A. Feiler, *Das neue Oesterreich*.

**AUSTRIA-HUNGARY** (in Ger. *Oesterreich*, that is, Eastern Empire). Previous to the changes resulting from the European War (1914-8), a Central European monarchy, inhabited by several nationalities, and consisting of the Austrian Empire, the Hungarian monarchy, and the territory of Bosnia and Hercegovina annexed by Austria on 5th Oct., 1908. The States had together a total area of about 261,242 sq. miles, and were bounded S. by Turkey, the Adriatic, and Italy; W. by Switzerland, Bavaria, and Saxony; N. by Prussia and Russian Poland; and E. by Russia and Romania.

At the close of the European War the Habsburg monarchy collapsed and the Austro-Hungarian Empire ceased to exist. Its territories were divided up, and after numerous treaties and plebiscites the result was a complete alteration of Central Europe. By the Treaty of St. Germain (1919) Bohemia, Moravia, and Ruthenia went to form the republic of Czechoslovakia;

Map of Austria

Galicia was given to Poland; Transylvania (also by Treaty of Trianon in 1920) became part of Romania; and Carniola, Croatia, Slavonia, Dalmatia, Bosnia, and Hercegovina were added to Serbia and Montenegro to form the new kingdom of Yugoslavia. All that then remained of the former empire became two independent states, the republic of Austria and the kingdom of Hungary.

**History.** In 791 Charlemagne drove the Avars from the territory between the Ens and the Raab, and united it to his empire under the name of *the Eastern Mark* (that is, March or boundary land); and from the establishment by him of a margravate in this new province the former Austrian Empire took its rise. On the invasion of Germany by the Hungarians it became subject to them from 900 till 955, when Otho I., by the victory of Augsburg, reunited a great part of this province to the German Empire, which by 1043 had extended its limits to the Leitha. The margravate of Austria was hereditary in the family of the Counts of Babenberg (Bamberg) from 982 till 1156, in which year the boundaries of Austria were extended so as to include the territory above the Ens, and the whole was created a duchy. The territory was still further increased in 1192 by the gift of the duchy of Styria as a fief from the Emperor Henry VI., Vienna being by this time the capital.

The male line of the House of Bamberg became extinct in 1246, and the Emperor Frederick II. declared Austria and Styria a vacant fief, the hereditary property of the German emperors. In 1282 the Emperor Rudolph granted Austria, Styria, and Carinthia to his two sons, Albert and Rudolph. The former became sole ruler (duke), and since then, until 12th Nov., 1918, Austria remained under the House of Habsburg. Albert, who was an energetic ruler, was elected emperor in 1298, but was assassinated in 1308. The first of his successors whom we need specially mention was Albert V., son-in-law of the Emperor Sigismund. He assisted Sigismund in the Hussite wars, and was elected, after his death, King of Hungary and of Bohemia, and German emperor (1438). Ladislaus, his posthumous son, was the last of the Austrian line proper, and its possessions devolved upon the collateral Styrian line in 1457; since which time the House of Austria furnished an unbroken succession of German emperors.

In 1453 the Emperor Frederick III., a member of this House, had conferred upon the country the rank of an archduchy before he himself became ruler of all Austria. His son Maximilian I., by his marriage with Mary, the surviving daughter of Charles the Bold, united the Netherlands to the Austrian dominions. After the death of his father, in 1493, Maximilian was made Emperor of Germany, and transferred to his son Philip the government of the Netherlands. He also added to his paternal inheritance Tyrol, with several other territories, particularly some belonging to Bavaria, and acquired for his family new claims to Hungary and Bohemia. The marriage of his son Philip to Joanna of Spain raised the

House of Habsburg to the throne of Spain.

Philip, however, died in 1506, and the death of Maximilian, in 1519, was followed by the union of Spain and Austria, his grandson (the eldest son of Philip), Charles I., King of Spain, being elected Emperor of Germany as Charles V. Charles thus became the greatest monarch in Europe, but in 1521 he ceded to his brother Ferdinand all his dominions in Germany. Ferdinand I., by his marriage with Anna, the sister of Louis II., King of Hungary, acquired the kingdoms of Hungary and Bohemia, with Moravia, Silesia, and Lusatia, the appendages of Bohemia. To oppose him the woywode of Transylvania, John Zapolya, sought the help of the Sultan, Soliman II., who appeared in 1529 at the gates of Vienna, but was compelled to retreat. In 1535 a treaty was made by which John Zapolya was allowed to retain the royal title and half of Hungary, but after his death new disputes arose, and Ferdinand maintained the possession of Lower Hungary only by paying Soliman the sum of 30,000 ducats annually (1562). In 1556 Ferdinand obtained the imperial crown, when his brother Charles laid by the sceptre for a cowl. He died in 1564, leaving his territories to be divided amongst his three sons.

Maximilian II., the eldest, succeeded his father as emperor, obtaining Austria, Hungary, and Bohemia; Ferdinand, the second son, received Tyrol and Lower Austria; and Charles, the youngest, obtained Styria, Carinthia, Carniola, and Görz. Maximilian died in 1576, and was succeeded on the imperial throne by his eldest son Rudolph II., who had already been crowned King of Hungary in 1572, and King of Bohemia in 1575. Rudolph's reign was distinguished by the war against Turkey and Transylvania; the persecutions of the Protestants, who were driven from his dominions; the cession of Hungary in 1608; and in 1611 of Bohemia and his hereditary estates in Austria to his brother Matthias.

Matthias, who succeeded Rudolph II. on the imperial throne, concluded a peace with the Turks, but was disturbed by the Protestant Bohemians, who took up arms in defence of their religious rights, thus commencing the Thirty Years' War. After his death in 1619 the Bohemians refused to acknowledge his successor, Ferdinand II., until after the battle of Prague in 1620, when Bohemia had to submit and was deprived of the right of choosing her king. Lutheranism was strictly forbidden in all the Austrian dominions. Hungary, which revolted under Bethlen Gabor, Prince of Transylvania, was, after a long struggle, subdued. During the reign of Ferdinand III. (1637-57), successor of Ferdinand II., Austria was continually the theatre of war; Lusatia was ceded to Saxony in 1635; and Alsace to France in 1648, when peace was restored in Germany by the Treaty of Westphalia.

The Emperor Leopold I., son and successor of Ferdinand III., was victorious through the talents of Prince Eugene in two wars with Turkey; and Vienna was delivered by Sobieski and the Germans from the attacks of Kara Mustapha in 1683. In 1687 he united Hungary to Transylvania, and in 1699 restored to Hungary the country lying between the Danube and the Theiss. It was the chief aim of Leopold to secure to Charles, his second son, the inheritance of the Spanish monarchy, and in 1701, upon the victory of French diplomacy in the appointment of the grandson of Louis XIV., the War of the Spanish Succession commenced. Leopold died in 1705, but Joseph I., his eldest son, continued the war. As he died without children in 1711, his brother Charles was elected emperor, but was obliged to accede in 1714 to the Peace of Utrecht, by which Austria received the Netherlands, Milan, Mantua, Naples, and Sardinia.

In 1720 Sicily was given to Austria in exchange for Sardinia. This monarchy now embraced over 190,000 sq. miles; but its power was weakened by new wars with Spain and France. In the peace concluded at Vienna (1735 and 1738) Charles VI. was forced to cede Naples and Sicily to Spain and part of Milan to the King of Sardinia; and in 1739, by the Peace of Belgrade, he was obliged to transfer to the Porte Belgrade, Serbia, etc., partly in order to secure the succession to his daughter, Maria Theresa, by the Pragmatic Sanction. He died in 1740.

On Maria Theresa's marriage to Francis Stephen, Duke of Lorraine (the dynasty henceforth being that of Habsburg-Lorraine), and her accession to the Austrian throne, the Empire was threatened with dismemberment. Fredcrick II. of Prussia subdued Silesia; the Elector of Bavaria was crowned in Lintz and Prague, and in 1742 chosen emperor under the name of Charles VII.; Hungary alone supported the heroic and beautiful queen. Charles, however, died in 1745, and the husband of Theresa was crowned Emperor of Germany as Francis I.; but a treaty concluded in 1745 confirmed to Frederick the possession of Silesia

and by the Peace of Aix-la-Chapelle, 1748, Austria was obliged to cede the duchies of Parma, Piacenza, and Guastalla to Philip, Infant of Spain, and several districts of Milan and Sardinia.

To recover Silesia, Maria Theresa formed an alliance with France, Russia, Saxony, and Sweden, and entered upon the Seven Years' War; but by the Peace of Hubertsberg, 1763, Silesia was recognised as Prussian territory. On the death of Francis I., in 1765, Joseph II., his eldest son, was appointed to assist his mother in the government and elected Emperor of Germany. The partition of Poland (1772) gave Galicia and Lodomeria to Austria, which also obtained Bukowina from the Porte in 1777. At the death of the Empress in 1780 Austria contained 235,000 sq. miles, with a pop. estimated at 24,000,000.

The liberal home administration of the Empress was continued and extended by her successor, Joseph II., who did much to further the spread of religious tolerance, education, and the industrial arts. The Low Countries, however, revolted, and he was unsuccessful in the war of 1788 against the Porte. His death took place in 1790. He was succeeded by his eldest brother, Leopold II., under whom peace was restored in the Netherlands, and in Hungary, and also with the Porte. On the death of his sister and her husband Louis XVI. of France he formed an alliance with Prussia, but died in 1792, before the French revolutionary war broke out.

His son, Francis II., succeeded, and was elected German Emperor, by which time France had declared war against him as King of Hungary and Bohemia. In 1795, in the third partition of Poland, West Galicia fell to Austria, and by the Peace of Campo-Formio (1797) she received the largest part of the Venetian territory as compensation for her loss of Lombardy and the Netherlands. In 1799 Francis, in alliance with Russia, renewed the war with France until 1801, when the Peace of Lunéville was concluded.

In 1804 Francis declared himself hereditary Emperor of Austria as Francis I., and united all his States under the name of the Empire of Austria, immediately taking up arms once more with his allies Russia and Great Britain against France. The war of 1805 was terminated by the Peace of Pressburg (26th Dec.), by which Francis had to cede to France the remaining provinces of Italy, as well as to give up portions of territory to Bavaria, Württemberg, and Baden, receiving in return Salzburg and Berchtesgaden.

After the formation of the Confederation of the Rhine (12th July, 1806) Francis was forced to resign his dignity as Emperor of Germany, which had been in his family more than 500 years. A new war with France in 1809 cost the monarchy 42,380 sq. miles of territory and 3,500,000 subjects. Napoleon married Maria Louisa, daughter of the Emperor, and in 1812 concluded an alliance with him against Russia. But in 1813 Francis again declared war against France, and formed an alliance with Britain, Prussia, and Sweden against his son-in-law. By the Congress of Vienna (1815) Austria gained Lombardy and Venetia, and recovered, together with Dalmatia, the hereditary territories which it had been obliged to cede.

In the troubled period following the French revolution of 1830 insurrections took place in Modena, Parma, and the Papal States (1831-2), but were suppressed without much difficulty; and though professedly neutral during the Polish insurrections, Austria clearly showed herself on the side of Russia, with whom her relations became more intimate as those between Great Britain and France grew more cordial. The death of Francis I. (1835) and accession of his son, Ferdinand I., made little change in the Austrian system of government, and much discontent was the consequence.

In 1846 the failure of the Polish insurrection led to the incorporation of Cracow with Austria. In Italy the declarations of Pio Nono in favour of reform increased the difficulties of Austria, and in Hungary the opposition under Kossuth and others assumed the form of a great constitutional movement. In 1848, when the expulsion of Louis Philippe shook all Europe, Metternich found it impossible any longer to guide the helm of the State, and the Government was compelled to admit a free press and the right of citizens to arms. Apart from the popular attitude in Italy and in Hungary, where the Diet declared itself permanent under the presidency of Kossuth, the insurrection made equal progress in Vienna itself, and the royal family, no longer in safety, removed to Innsbruck. After various ministerial changes the Emperor abdicated in favour of his nephew, Francis Joseph; more vigorous measures were adopted; and Austria, aided by Russia, reduced Hungary to submission.

The year 1855 is memorable for the Concordat with the Pope, which put the educational and ecclesiastical

affairs of the Empire entirely into the hands of the Papal see. In 1859 the hostile intentions of France and Sardinia against the possessions of Austria in Italy became so evident that she declared war by sending an army across the Ticino; but after disastrous defeats at Magenta and Solferino she was compelled to cede Milan and the north-west portion of Lombardy to Sardinia. In 1864 she joined with the German States in the war against Denmark, but a dispute about Schleswig-Holstein involved her in a war with her allies (1866), while at the same time Italy renewed her attempts for the recovery of Venice. The Italians were defeated at Custozza and driven back across the Mincio; but the Prussians, victorious at Königgrätz (or Sadowa), threatened Vienna. Peace was concluded with Prussia on 23rd Aug. and with Italy on 3rd Oct., the result of the war being the cession of Venetia through France to Italy and the withdrawal of Austria from all interference in the affairs of Germany.

For nearly half a century (from 1866 to 1914) the internal affairs of Austria-Hungary gave much occupation to statesmen of the dual monarchy. Hungarian demands for self-government were finally agreed to, and the Empire was divided into the two parts already mentioned—Austria and Hungary. This settlement was consummated by the coronation of the Emperor Francis Joseph I., at Budapest, as King of Hungary, on 8th June, 1867. In the same year the Concordat of 1855 came up for discussion, and measures were passed for the re-establishment of civil marriage, the emancipation of schools from the domination of the Church, and the placing of different creeds on a footing of equality.

The fact of the Austro-Hungarian dominions comprising so many different nationalities gave the central Government much trouble, both in regard to internal and to external affairs. In regard to the "Eastern Question," for instance, the action of Austria was hampered by the sympathies shown by the Magyars for their blood relations, the Turks, while the Slavs were naturally more favourable to Russia. During the war between Russia and Turkey in 1877-8 Austria remained neutral; but at its close it was decided at the Congress of Berlin that Bosnia and Hercegovina should in future be administered by Austria instead of Turkey. In 1908, taking advantage of the condition of Turkey, Austria formally annexed these provinces. By the middle of Oct., 1918, the Austro-Hungarian monarchy began to break up into independent national States. Four States of some size laid claim to independence: Austria, Czechoslovakia, Hungary, and Yugoslavia. For more recent history see beginning of this article; AUSTRIA; CZECHOSLOVAKIA; YUGOSLOVIA; FRANCIS JOSEPH; EUROPEAN WAR.—BIBLIOGRAPHY: S. Whitman, *Austria* (in Story of the Nations Series); H. W. Steed, *The Hapsburg Monarchy*; J. Baker, *Austria*: *Her People and Her Homeland*; H. Friedjung, *Oesterreich von*, 1848-60.

**AUTEUIL** (ō-tē-yē). Formerly a suburban village of Paris, but now enclosed within the fortifications.

**AUTHOR.** Person who produces or creates something, chiefly one who writes, and so creates a piece of literature or music, whether novel, article, play, poem, opera, or sonata. The writing is the author's property until he sells it, and as such is protected in all civilised countries by the law of copyright.

In Great Britain the Incorporated Society of Authors, Playwrights and Composers exists to protect the interests of authors. It was founded in 1883. Any writer can become a member on payment of a small subscription. The offices are at 11 Gower Street, London, W.C. The Authors' Club is at 2 Whitehall Court, S.W. 1.

**AUTOBIOG'RAPHY.** A department of literature of which, as a definite branch or form at least, we have no very ancient examples, though many autobiographical details are contained, for instance, in Cicero's and Pliny's letters, while St. Augustine has left a fragmentary autobiography in his *Confessions*. Various writers of note, without claiming or perhaps intending to write a formal autobiography, have left similar materials in the form of their own memoirs or reminiscences, or, for a portion of their lives, in diaries. The chief English diarists are Pepys and Evelyn, while Crabb Robinson is an admirable modern example.

Brief autobiographies were written by Gibbon, Hume, and Sir Walter Scott (of his early life only), and among other writers who have given us autobiographies or kindred works are Fanny Burney, Cobbett, Haydon, Miss Mitford, Harriet Martineau, Leigh Hunt, Hugh Miller (in *My Schools and Schoolmasters*), John Stuart Mill, Anthony Trollope, Sir Henry Taylor, Miss F. P. Cobbe, Carlyle, Ruskin, Herbert Spencer, Alexander Bain, and Alfred Russel Wallace. Lord Roberts's *Forty-one Years in India* and General Grant's *Personal Memoirs* are most interesting autobiographical works by

men of action. One of the most famous of autobiographies is that of the Italian Benvenuto Cellini. George Borrow's *Lavengro* and *The Romany Rye* are autobiography with a substratum of fiction.

**AUTOCHTHONES** (ä-tok'tho-nēz). The Greek name for the aboriginal inhabitants of a country. *See* ABORIGINES.

**AU'TOCLAVE** (derived from the Gr. *autos*, self, and Lat. *clavis*, key). Is a strong steam-tight vessel in which hydrolysis of liquids can be carried out, under pressure, at temperatures considerably higher than their normal boiling-points. The vessels may be of copper, iron, or other suitable material, are sometimes enamelled within, or may have renewable refractory linings when used for corrosive liquids. Some types have mechanical agitators. Used in the manufacture of candles, coal-tar colours, etc. May be heated by high-pressure steam or in baths of oil or molten lead. *See* PAPIN.

**AU'TOCRAT** (Gr. *autos*, self, *kratos*, rule). An absolute or uncontrolled ruler; the head of a State who is not controlled by any constitutional limitations, such as the Tsars of Russia till 1917.

**AUTO-DE-FE** (Sp.); **AUTO-DA-FE** (Pg.). Literally, "act of faith." *See* INQUISITION.

**AU'TOGRAPH.** A person's own handwriting; an original manuscript or signature, as opposed to a copy. The practice of collecting autographs or signatures originated in Germany and the Low Countries, chiefly among members of the universities, and dates at least from the sixteenth century. Among the earliest collections known are those of John Cotton and Hans Sloane in the British Museum, and of Philippe de Bethune, brother of Sully, and Loménie de Brienne at the Bibliothèque Nationale. The most celebrated collection formed in England in recent years is that of Alfred Morrison (1821-97), which ranges from the fifteenth to the nineteenth centuries, and contains manuscripts of great importance.

**AUTOM'ATISM.** The confinement of activity in men or animals within a purely mechanical limit, resulting from injury to or partial removal of the brain.

**AUTOM'ATON** (Gr. *automatos*, spontaneous). A self-moving machine performing actions like those of a living being, and often shaped like one. The walking statues of Dædalus, the flying dove of Archytas, the brazen head of Friar Bacon, the iron fly of Regiomontanus, the door-opening figure of Albertus Magnus, the parading knights of the clock presented to Charlemagne by Harun al Rashid, the toy carriage and attendants constructed by Camus for Louis XIV., the flute-player, tambour-player, and duck of Vaucanson, and the writing child of the brothers Droz are among the more noteworthy of traditional automata. *See* CONJURING.

**AUTOMOBILE.** *See* MOTOR VEHICLES.

**AUTON'OMY.** The power of a State, institution, etc., to legislate for itself.

**AUTOPH'AGI** (-jī). Birds which feed themselves as soon as hatched.

**AU'TOPLASTY.** The operation by which wounds and diseased parts are repaired with healthy tissues taken from other parts of the same person's body.

**AUTOPLATE.** *See* PRINTING.

**AUTOP'SY.** Literally, personal observation or inspection, commonly restricted to post-mortem examination. *See* CORONER.

**AU'TOTYPE.** A species of photographic print. A thin sheet of gelatine on paper is rendered sensitive to light by treatment with bichromate of potash, and then exposed under an ordinary photographic negative. The portions of gelatine affected by the light become insoluble, the remainder of the gelatine is then washed away, and the picture remains reproduced in the gelatine, there being slight elevations and depressions corresponding with the distribution of light and shade. This may be printed from, but it is more often made use of to obtain electrotypes or other reverses, from which impressions can more easily be taken.

**AUTUMN.** The season between summer and winter, in the northern hemisphere often regarded as embracing August, September, and October, or three months about that time. The beginning of the astronomical autumn is 22nd Sept., the autumnal equinox; and the end is 21st Dec., the shortest day. The autumn of the southern hemisphere takes place at the time of the northern spring.

**AUTUN** (ō-tŭn; ancient, **BIBRACTE**, later, **AUGUSTODUNUM**). A town, South-Eastern France, department of Saône-et-Loire. It has two Roman gates of exquisite workmanship, the ruins of an amphitheatre and of several temples, the cathedral of St. Lazare, a fine Gothic structure of the twelfth century with chapels added in the fifteenth; manufactures of

carpets, woollens, cotton, velvet, hosiery, etc. Pop. 15,498.

**AUTUNITE.** A hydrous phosphate of uranium and calcium, crystallising in the rhombic system in yellow plates. Like other minerals of the uranium series it shows radio-activity.

**AUVERGNE** (ō-vâr-nyė). A province, Central France, now merged into departments Cantal and Puy-de-Dôme, and an arrondissement of Haute-Loire. The Auvergne Mountains, separating the basins of the Allier, Cher, and Creuse from those of the Lot and Dordogne, contain the highest points of Central France: Mount Dor, 6188 feet; Cantal, 6093 feet, and Puy-de-Dôme, 4806 feet. The number of extinct volcanoes and general geologic formation make the district one of great scientific interest. The minerals include iron, copper, and lead, and there are warm and cold mineral springs. Auvergne contributes a large supply to the labour markets of Paris and Belgium, there being in Paris alone some 50,000 Auvergnats.

**AUXERRE** (ō-sâr). A town, France, department of Yonne, 110 miles S.E. of Paris. Principal edifices: a fine Gothic cathedral, unfinished; the abbey of St. Germain, with curious crypts; and an old episcopal palace, now the Hôtel de Prefecture; it manufactures woollens, hats, casks, leather, earthenware, violin strings, etc.; trade, chiefly in wood and wines, of which the best known is white Chablis. Pop. 21,930.

**AUXOM'ETER.** An instrument to measure the magnifying powers of an optical apparatus.

**AUXONNE** (ō-son; ancient, **AUSSONA**). A town, France, department of Côte-d'Or (Burgundy), on the Saône; a fortified place, with some manufactures. Pop. 6300.

**A'VA.** A town in Asia, formerly the capital of Burma, on the Irrawaddy, now almost wholly in ruins.

**AVA-AVA, ARVA, KAVA,** or **YAVA** (*Macropiper methysticum*). A plant of the nat. ord. Piperaceæ (pepper family), so called by the inhabitants of Polynesia, who make an intoxicating drink out of it. Its leaves are chewed with betel, in South-Eastern Asia.

**AVAD'AVAT.** *See* AMADAVAT.

**AV'ALANCHES.** Large masses of snow or ice precipitated from the mountains, and distinguished as *wind* or *dust avalanches* when they consist of fresh-fallen snow whirled like a dust-storm into the valleys; as *sliding avalanches* when they consist of great masses of snow sliding down a slope by their own weight; and as *glacier* or *summer avalanches* when ice-masses are detached by heat from the high glaciers.

**AVAL ISLANDS.** Same as BAHREIN ISLANDS.

**AVALLON** (â-vâ-lōn). A town of Central France, department Yonne. Pop. 5900.

**AV'ALON.** A sort of fairyland or elysium mentioned in connection with the legends of King Arthur, being his abode after disappearing from the haunts of men: called also *Avilion*. The name is also identified with Glastonbury; and has been given to a peninsula of Newfoundland.

**AVAN'TURINE,** or **AVEN'TURINE.** A variety of quartz containing glittering spangles of mica through it; also a sort of artificial gem of similar appearance.

**AV'ARS.** A nation, probably of Turanian origin, who at an early period may have migrated from the region east of the Tobol in Siberia to that about the Don, the Caspian Sea, and the Volga. A part advanced to the Danube in A.D. 555, and settled in Dacia. They served in Justinian's army, aided the Lombards in destroying the kingdom of the Gepidæ, and in the sixth century conquered under their Khan Bajan the region of Pannonia. They then won Dalmatia, pressed into Thuringia and Italy against the Franks and Lombards, and subdued the Slavs dwelling on the Danube, as well as the Bulgarians on the Black Sea. But they were ultimately limited to Pannonia, where they were overcome by Charlemagne, and nearly extirpated by the Slavs of Moravia. After 827 they disappear from history. Traces of their fortified settlements are found, and known as Avarian rings. *See* LESGHIANS.

**AVATAR',** more properly **AVATARA.** In Hindu mythology, an incarnation of the Deity. Of the innumerable avatars, the chief are the ten incarnations of Vishnu, who appeared successively as a fish, a tortoise, a boar, a man-lion, a dwarf, etc.

**AVATCH'A.** A volcano and bay in Kamchatka. The volcano, which is 9000 feet high, was last active in 1855. The town of Petropavlovsk lies in the bay.

**AVEBURY** (āv'be-ri). A village of England, in Wiltshire, occupying the site of a so-called Druidical temple, which originally consisted of a large outer circle of 100 stones, from 15 to 17 feet in height, and about 40 feet in circumference, surrounded by a broad ditch and lofty rampart, and enclosing two smaller circles. Few

traces now remain of the structure. On the neighbouring downs are numerous barrows or tumuli, one of which, called Silbury Hill, rises to the height of 130 feet, with a circumference of 2027 feet at the base, covering fully 5 acres.

**AVEBURY, John Lubbock.** First Baron. *See* LUBBOCK.

**AVEIRO** (à-vā'i-rụ), A coast town in Portugal, province of Douro, with a cathedral, an active fishery, and a thriving trade. Pop. 11,523.

**AVELLINO** (à-vel-lē'nō). A town in Southern Italy, capital of the province of Avellino, 29 miles east of Naples, the seat of a bishop. Avellino nuts were celebrated under the Romans. Pop. 24,620. Area of the province, 1165 sq. miles; pop. 411,813.

**A'VE MARI'A** ("Hail, Mary"). The first two words of the angel Gabriel's salutation (Luke i. 28), and the beginninging of the very common Latin prayer to the Virgin in the Roman Catholic Church. Its lay use was sanctioned at the end of the twelfth century, and a papal edict of 1326 ordains the repetition of the prayer thrice each morning, noon, and evening, the hour being indicated by sound of bells called the Ave Maria or Angelus Domini. The prayers are counted upon the small beads of the rosary, as the paternosters are upon the large ones.

**AVE'NA.** *See* OAT.

**AV'ENS.** The English name of two rosaceous plants of the genus Geum. Common avens, or herb-bennet, *G. urbānum*, possesses astringent properties, and was formerly used in medicine. The mountain avens, *Dryas octopetala*, belongs to the same nat. ord.

**AV'ENTINE.** One of the seven hills of Rome, east of the Tiber.

**AV'ERAGE.** Often has, in mercantile affairs, the meaning of a fair mean between extremes, e.g. wheat is to be of a "fair average quality of the season's shipments," not so good as the best nor so bad as the worst. The question of standard is usually decided by the inspection of experienced merchants in the trade.—**Average** in shipping retains its original use of the term, which really means loss of things. If the violence of a storm necessitates the voluntary sacrifice of equipment, say of the mast, it is very old maritime law that everything that has been thereby saved to arrive must contribute rateably to the cost of what has been voluntarily lost. This is known as a *general average* contribution. If, however, the ship is dismasted by the storm there is no contribution and it is said to be a case of *particular average*. Should the vessel be totally lost there is no basis for a general average claim, nor does such a claim in any case apply to lives or seamen's effects. Though the law relating to average has not primarily any concern with insurance, marine policies always have a clause dealing with the liabilities of the underwriter for average.

**AVER'NUS.** A lake, now called **Lago d'Averno**, in Campania, Italy, between the ancient Cumæ and Puteoli, about 8 miles from Naples. It is the crater of an old volcano, and is in some places 180 feet deep. Formerly the gloom of its forest surroundings and its mephitic exhalations caused it to be regarded as the entrance to the infernal regions. It was the fabled abode of the Cimmerians, and especially dedicated to Proserpine.

**AVERROES** (a-ver'o-es; corrupted from **Ibn Roshd**). The most renowned Arabian philosopher, born at Cordova, in Spain, 1126, died at Morocco 1198. His ability procured him the succession to his father's office of chief magistrate, and the King of Morocco appointed him at the same time cadi in the province of Mauretania. Accused of being an infidel, he was, however, deprived of his offices, and banished to Spain; but, being persecuted there also, he fled to Fez, where he was condemned to recant and undergo public penance. Upon this he went back to his own country, where the Caliph Almansur finally restored him to his dignities. Averroes regarded Aristotle as the greatest of all philosophers, and devoted himself so largely to the exposition of his works as to be called among the Arabians *The Interpreter*. He wrote a compendium of medicine, and treatises on theology, philosophy, jurisprudence, etc. His commentaries upon Aristotle appeared before 1250 in a Latin translation attributed to Michael Scott, the reputed wizard (1194-1250), and others. Averroes was at once a philosopher, a theologian, and a theosophist.

**AVERRUNCA'TOR.** A garden implement for prunning trees without a ladder, consisting of two blades similar to stout shears, one fixed rigidly to a long handle, and the other moved by a lever to which a cord passing over a pulley is attached.

**AVER'SA.** A well-built town of Southern Italy, 7 miles N. of Naples, in a beautiful vine and orange district, the seat of a bishop, with a cathedral and various religious institutions, and a large lunatic asylum. Andreas of

Hungary, husband of Queen Joanna I., was strangled in a convent here, 18th Sept., 1345. Pop. 23,203.

**AVESNES** (à-vān). A town of France, department Nord. Pop. 5829.

**AVESTA.** *See* ZENDAVESTA.

**AVEYRON** (à-vā-rōn). A department occupying the southern extremity of the central plateau of France, traversed by mountains belonging to the Cevennes and the Cantal ranges; principal rivers: Aveyron, Lot, and Tarn, the Lot alone being nagivable. The climate is cold, and agriculture is in a backward state, but considerable attention is paid to sheep-breeding. It is noted for its "Roquefort cheese." It has coal, iron, and copper mines, besides other minerals. Area, 3385 sq. miles; capital, Rhodez. Pop. (1926), 328,886.

**AVEZZANO** (à-vet-zä'nō). A town of S. Italy, province Aquila. Pop. 11,279.

**AV'IARY.** A building or enclosure for keeping, breeding, and rearing birds. Aviaries appear to have been used by the Persians, Greeks, and Romans, and are highly prized in China. In England they were in use at least as early as 1577, when William Harrison refers to "our costlie and curious avaries." An aviary may be simply a kind of very large cage, or a series of enclosures.

**AVIATIK.** A German type of biplane. It was originally built at Mulhausen in Alsace.

**AVIATION.** *See* AERONAUTICS.

**AVICEN'NA,** or **EBN-SINA.** An Arabian philosopher and physician, born at Kharmaithen, in the province of Bokhara, A.D. 980. After practising as a physician he quitted Bokhara at the age of twenty-two, and for a number of years led a wandering life, settling at last at Hamadan, subsequently as vizier of the Emir. On the death of his patron he lived in retirement at Hamadan, but having secretly offered his services to the Sultan of Ispahan he was imprisoned by the new Emir. Escaping, he fled to Ispahan, was received with great honour by the Sultan, and passed there in quietness the last fourteen years of his life, writing upon medicine, logic, metaphysics, astronomy, and geometry. His philosophy was Aristotelianism mingled with neo-Platonism, and his influence is most marked in Dante and the Mystics. He died at Hamadan, in Northern Persia, 1037, leaving many writings, mostly commentaries on Aristotle. Of his 100 treatises the best known is the *Canon Medicinæ*, which was still in use as a text-book at Louvain and Montpellier in the middle of the seventeenth century. His *Philosophia Orientalis*, mentioned by Roger Bacon, is lost.

**AVIE'NUS, Rufus Festus.** A Latin descriptive poet, who flourished about the end of the fourth century A.D., and wrote *Descriptio Orbis Terræ*, a general description of the earth; *Ora Maritima*, an account of the Mediterranean coasts, etc.

**AVIFAU'NA.** A collective term for the birds of any region.

**AVIVLIANO** (à-vēl-yä'nō). A town of S. Italy, province Potenza. Pop. 17,413.

**AVIGNON** (à-vē-nyōn; ancient, **AVENIO**). An old town of S.E France, capital of department Vaucluse, on the left bank of the Rhone; enclosed by lofty battlemented and turreted walls, well built, but with rather narrow streets. It is an archbishop's see since 1475, and has a large and ancient cathedral on a rock overlooking the town, the immense palace in which the Popes resided (used as a barracks and prison for a long time), and other old buildings. The industries of the city are numerous and varied, the principal being connected with silk. The silk manufacture and the breeding of silk-worms are the principal employments in the district. Here Petrarch lived several years, and made the acquaintance of Laura, whose tomb is in the Franciscan church. From 1309 to 1377 seven Popes in succession, from Clement V. to Gregory XI., resided in this city. After its purchase by Pope Clement VI., in 1348, Avignon and its district continued, with a few interruptions, under the rule of a vice-legate of the Pope's till 1791, when it was formally united to the French Republic. Pop. 49,304.

**AVIGNON BERRIES.** *See* FRENCH BERRIES.

**AVILA** (ä'vē-lä). A town of Spain, capital of province of Avila, a modern division of Old Castile. It is the see of the Bishop suffragan of Santiago, with fine cathedral. Once one of the richest towns of Spain. Principal employment in the town, spinning; in the province, breeding sheep and cattle. Pop., town, 12,060; province, 212,300.

**AVILA, Gil Gonzalez d'.** A Spanish antiquary and biographer, 1577-1658; made historiographer of Castile in 1612, and of the Indies in 1641. Most valuable works: *Teatro de las Grandezas de Madrid*, 1623, and *Teatro Ecclesiastico*, 1645-53.

**AVILA Y ZUÑIGA** (ä'vē-lä ē thō-nyē'gä), **Don Luis d'.** Spanish general, diplomatist, and historian; a favourite

of Charles V.; born about 1490, died about 1560. His chief work, printed in 1548 and translated into five languages, was on the war of Charles V. in Germany.

**AVILES** (à-vē'les). A town of Northern Spain, province Oviedo, with a good harbour. Pop. 13,660.

**AVIZ.** An order of knighthood in Portugal, instituted by Sancho, its first king, and having as its original object the subjection of the Moors.

**AVIZAN'DUM.** In Scots law, private consideration. To make *avizandum* is to remove a cause from the public court to the private consideration of the judge.

**AVLO'NA** (Ital. *Valona*). A seaport of Albania on the Adriatic, with a considerable trade. It was occupied and made a naval and military base by the Italians during the European War. Pop. 6500.

**AVO'CA,** or **OVOCA.** A river and valley in Ireland, County Wicklow, celebrated as the scene and subject of one of Moore's *Irish Melodies*. The river is formed by the union of the Avonbeg and Avonmore, and below the junction receives the Aughrim, the name in Celtic signifying "the meeting of the waters." After a course of about 9 miles it falls into the sea about a mile below Arklow. The scenery here is singularly beautiful, and attracts many visitors.

**AVOCA'DO-PEAR.** *See* ALLIGATOR-PEAR.

**AVOGAD'RO'S LAW.** In physics, asserts that equal volumes of different gases at the same pressure and temperature contain an equal number of molecules.

**AVOIRDUPOIS** (a-vèr'dụ-pois; from old French, literally, "goods of weight"). A system of weights used for all goods except precious metals, gems, and medicines, and in which a pound contains 16 ounces, or 7000 grains, while a pound troy contains 12 ounces, or 5760 grains. A hundredweight contains 112 pounds avoirdupois; a *cental* of 100 pounds is common in America, and is a legal British weight. *See* WEIGHTS AND MEASURES.

**AV'OLA.** A seaport on the east of Sicily, with a trade in almonds, sugar, etc. Pop. 17,711.

**A'VON.** The name of several rivers in England, of which the principal are: (1) The Upper Avon, rising in Leicestershire, and flowing S.W. into the Severn at Tewkesbury. Stratford-on-Avon lies on this river. (2) The Lower Avon, rising in Gloucestershire, and falling into the Severn N.W. of Bristol; navigable as far as Bath. (3) In Monmouthshire. (4) In Wiltshire and Hampshire, entering the English Channel at Christchurch Bay. There are also streams of this name in Wales and Scotland.

**AVONMOUTH.** A place at the mouth of the River Avon, 6 miles from Bristol, and connected with it by rail and river, with large docks belonging to the Bristol corporation, and forming part of the shipping accommodation of that city.

**AV'OSET.** A bird about the size of a lapwing, of the genus Recurvirostra (*R. avosetta*), family Scolopacidæ

Avoset (*Recurvirostra avosetta*)

(snipes), ord. Grallatores. The bill is long, slender, elastic, and bent upward toward the tip, the legs long, the feet webbed, and the plumage variegated with black and white. The bird feeds on worms and other small animals, which it scoops up from the mud of the marshes and fens that it frequents. It is found in Europe, Asia, Africa, and America; but the American species is slightly different from the others.

**AVRANCHES** (à-vränsh; ancient, **ABRINÆ**). A town, France, department La Manche, about 3 miles from the Atlantic. It formerly had a fine cathedral, destroyed during the first French revolution. Manufactures: lace, thread, and candles. Pop. 7174.

**AWE** (ą). A Scottish loch in Argyllshire, about 28 miles long and 2 broad, and communicating by the Awe with Loch Etive. Ben Cruachan

stands at its northern extremity. It has many islands and beautiful scenery, and abounds in trout, salmon, etc.

**AXE,** or **AX.** A well-known tool for cutting or chipping wood, consisting of an iron head with an arched cutting edge of steel, which is in line with the wooden handle of the tool, and not at right angles to it as in the adze.

**AXEL.** *See* ABSALON.

**AXE-STONE.** *See* JADE.

**AXHOLME ISLE** (aks'ōm). A sort of island in England formed by the Rivers Trent, Idle, and Don, in the north-west angle of Lincolnshire, 17 miles long, 4½ broad.

**AXIL,** or **AXILLA.** In botany, the angle between the upper side of a leaf

Leaf and stem of Horse-chestnut showing axil

and the stem or branch from which it springs. Buds usually appear in the axils, and flowers or flower-stalks growing in this way are called *axillary*.

**AX'IM.** A town of W. Africa, on the Gold Coast.

**AX'INITE.** A mineral, silicate of alumina, lime, etc., with boracic acid, deriving its name from the form of the crystals, the edges of which bear some resemblance to the edge of an axe.

**AXIN'OMANCY.** An ancient method of divination by the movements of an axe (Gr. *axinē*) balanced on a stake, or of an agate placed on a red-hot axe. The names of suspected persons being uttered, the movements at a particular name indicated the criminal.

**AX'IOM.** A universal proposition, which the understanding must perceive to be true as soon as it perceives the meaning of the words, and therefore called a *self-evident truth* : e.g. *A* is *A*. In mathematics, axioms are those propositions which are assumed without proof, as being in themselves independent of proof, and which are made the basis of all the subsequent reasoning ; as, " The whole is greater than its part ; " " Things that are equal to the same thing are equal to one another." *See* GEOMETRY.

**AXIS.** The straight line, real or imaginary, passing through a body or magnitude, on which it revolves, or may be supposed to revolve ; especially a straight line with regard to which the different parts of a magnitude, or several magnitudes, are symmetrically arranged ; e.g. the *axis of the world*, the imaginary line drawn through its two poles.

In *botany* the word is also used, the stem being termed the *ascending axis*, the root the *descending axis*.

In *anatomy* the name is given to the second vertebra from the head, that on which the *atlas* moves. *See* ATLAS.

**AXIS** (*Cervus axis*). A species of Indian deer, also known as the Spotted Hog-deer, of a rich fawn colour, nearly black along the back, with white spots, and under parts white. Breeds freely in many parks in Europe.

**AX'MINSTER.** A market town, England, county Devon, on the Axe, at one time celebrated for its woollen cloth and carpet manufactures, and giving name to an expensive variety of carpet having a thick soft pile, and also to a cheaper variety. Pop. (1931), 2327.

**AX'OLOTL** (*Amblystŏma maculātum*). A curious Mexican amphibian, not unlike a newt, from 8 to 10 inches in length, with gills formed of three long ramified or branch-like processes floating on each side of the neck. It reproduces by laying eggs, and was for some time regarded as a perfect animal with permanent gills. It is said, however, that they frequently lose their gills like the other members of the genus, though some authorities maintain that the true axolotl never loses its gills, and that merely confusion with *A. tigrinum* has led to the belief, as this species sometimes retains its b anchiæ, though usually it loses them. The axolotl is esteemed a luxury by the Mexicans. There are a number of species of Amblystoma in North America.

**AX'UM,** or **AKSUM.** A town in Tigré, a division of Abyssinia, once the capital of an important kingdom, and at one time the great depot of the ivory trade in the Red Sea. It is the seat of an *abuna* or Patriarch, and has a pop. of 5000. The site of the town still exhibits many remains of its former greatness

**AYACUCHO** (ä-yä-kö'chō). The name of a department of Peru, and of its capital. The department has an

area of 18,185 sq. miles; a pop. of 302,469. The town (formerly Guamanga or Huamanga) has a cathedral and a university, and a pop. of 20,000.

**AYALA** (ä-yä'lä), **Pedro Lopez de.** Spanish historian and poet, Chancellor of Castile in the second half of the fourteenth century, and the author of a history of Castile from 1350 to 1396. He took an active part in the struggle between Henry II. and Pedro the Cruel, and was taken prisoner by the English in 1367. During his English captivity he wrote part of his chief poetical work, *A Book in Rhyme concerning Court Life*. Died 1407.

**AYAMONTE** (ä-yä-mon'tā). A seaport town, Spain, province of Huelva, 2 miles from the mouth of the Guadiana. Pop. 6000.

**AYASS'OLUK.** *See* EPHESUS.

**AYE-AYE** (ī-ī; *Cheiromys madagascariensis*). An animal of Madagascar, so called from its cry; now re-

Aye-aye (*Cheiromys madagascariensis*)

ferred to the lemur family. It is about the size of a hare, has large flat ears and a bushy tail; large eyes; long sprawling fingers, the third so slender as to appear shrivelled; colour, musk-brown, mixed with black and grey ash; feeds on grubs, fruits, etc.; habits, nocturnal. *See* PRIMATES, LEMURS.

**AYESHA** (a-yesh'a). Daughter of Abu-Bekr and favourite wife of Mahomet, though she bore him no child, born in 610 or 611. After his death she opposed the succession of Ali, but was defeated and taken prisoner. She died at Medina in 677 or 678 (A.H. 58).

**AYLESBURY** (ālz'be-ri). County town of Buckinghamshire, England, with a fine old parish church; chief industries, silk-throwing, printing, making condensed milk, and poultry-rearing for the London market. The Aylesbury duck, also called "white English," is famous. Previous to 1885 it and its hundred sent two members to Parliament, and it still gives its name to a parliamentary division. Pop. (1931), 13,382.

**AY'LOFFE, Sir Joseph.** An English antiquary, born about 1708, died 1781; member of the first council of the Society of Antiquaries, a commissioner for the preservation of State papers, the author and editor of several works, of which the best known is his *Calendars of the Auntient Charters*, etc.

**AYMARAS** (ī'mä-räz). An Indian race of Bolivia and Peru, speaking a language akin to the Quichua.

**AY'MON.** The surname of four brothers, Alard, Richard, Guiscard, and Renaud, who hold a first place among the heroes of the Charlemagne cycle of romance. Their exploits were the subject of a romance, *Les Quatre Fils d'Aymon*, by Huon de Villeneuve, a trouvère of the thirteenth century, and Renaud is a leading figure in Ariosto's *Olando*.

**AYR** (ār). A town of Scotland, a royal and parliamentary burgh, and capital of Ayrshire, at the mouth of the River Ayr, on the Firth of Clyde. It was the site of a Roman station. William the Lion built a castle there in 1197 and constituted it a royal burgh in 1202; and the Parliament which confirmed Robert Bruce's title to the crown sat in Ayr. It is picturesquely situated, and has excellent public and other buildings. Two bridges connect Ayr proper with the suburbs of Newton and Wallacetown, a third stands farther up the river. The "New Brig" of Burns's "Brigs of Ayr" (built in 1788) had to be replaced by a new structure in 1879, while the "Auld Brig" (built in 1252) still stands, after being repaired. Carpets, lace goods, leather, iron goods, etc., are manufactured. The harbour accommodation is good, and in particular coals are largely exported. The house in which Burns was born stands within 1½ miles of the town, and near "Alloway's auld haunted kirk," and a monument to him is near. Ayr, Ardrossan, Irvine, Prestwick, Saltcoats, and Troon send a member to Parliament. Pop. (1931), 36,784.

**County** The county has an area of 724,523 acres. It is divided into the districts of Carrick in the south, Kyle in the middle, and Cunningham in the north. The surface is irregular, and a large portion of it hilly, but much of it is fertile. The principal streams are the Ayr, Stinchar, Girvan, Doon, Irvine, and Garnock. Coal and iron are abundant; and there are numerous collieries and ironworks.

Limestone and freestone are also abundant. Agriculture is in a flourishing state, the principal crops being oats, turnips, and early potatoes, while dairy husbandry is extensively practised; the Ayrshire cows, referred to in the eighteenth century as the Cunningham, are celebrated as milkers, and Ayrshire cheese ("Dunlop" and "Cheddar") has a high reputation. Woollen manufactures are extensive, particularly carpets and bonnets; lace goods are largely made; Kilmarnock is a centre of engineering and of dairying education. Goods made include explosives, boots and shoes, chemicals, and leather. Chief towns: Ayr, Kilmarnock, Irvine, Ardrossan, Saltcoats, Stevenston, Maybole. Ayr and Buteshire send three members to Parliament. Pop. (1931), 285,184.

**AYRER** (ī'rer), **Jacob.** A German dramatist of the sixteenth century, who almost rivalled Hans Sachs in copiousness and importance. He was a citizen and legal official of Nuremberg, and died in 1605. His works, published at Nuremberg in 1618, under the title *Opus Theatricum*, include thirty comedies and tragedies and thirty-six humorous pieces.

**AYRTON, William Edward.** English physicist and electrical engineer, born in 1847. From 1873 to 1879 he was professor of natural philosophy and telegraphy in the Imperial College of Engineering at Tokio. In 1879 he was appointed professor of applied physics in the City and Guilds of London Institute. He invented an ammeter, voltmeter, etc., in conjunction with Professor Perry. He died in 1908. He published *Practical Electricity*, and many papers on scientific subjects.

**AYTOUN** (ā'tun), **Sir Robert.** Poet, born in Fifeshire, Scotland, 1570, died 1638. After studying at St. Andrews he lived for some time in France, whence, in 1603, he addressed a panegyric in Latin verse to King James on his accession to the crown of England. By the grateful monarch he was appointed one of the gentlemen of the bedchamber, and private secretary to the queen, receiving also the honour of knighthood. At a later period of his life he was secretary to Henrietta Maria, queen of Charles I. His poems are few in number, but are distinguished by elegance of diction. Several of his Latin poems are preserved in the work called *Delitiæ Poetarum Scotorum*, published at Amsterdam in 1637 at the expense of Sir John Scot of Scotstarvet.

**AYTOUN, William Edmonstoune.** Poet and prose writer, born at Edinburgh in 1813, died at Blackhills, Elgin, 1865. He studied at the University of Edinburgh, became a writer to the signet in 1835, and passed as advocate in 1840. He issued a volume of poems in 1832, by 1836 was a contributor to *Blackwood's Magazine*, and in 1840 he published the *Life and Times of Richard I.* In 1848 he published a collection of ballads entitled *Lays of the Scottish Cavaliers*, which has proved the most popular of all his works. It was followed in 1854 by *Firmilian, a Spasmodic Tragedy* (intended to ridicule certain popular writers); the *Bon Gaultier Ballads* (parodies and other humorous pieces, in conjunction with Theodore Martin), 1855; in 1856 the poem *Bothwell*; and in subsequent years by *Norman Sinclair*, *The Glenmutchkin Railway*, and other stories. In 1858 he edited a critical and annotated collection of the *Ballads of Scotland*. A translation of the poems and ballads of Goethe was executed by him in conjunction with Theodore Martin. In 1845 he became professor of rhetoric and English literature in the University of Edinburgh—a position which he held till his death. In 1852 he was appointed Sheriff of Orkney and Shetland.

**AYUNTAMIENTO** (ä-yun-tä-mē-en'tō). The name given to the town and village councils in Spain and Spanish America.

**AYU'THIA.** The ancient capital of Siam, on the Menam, now a scene of splendid ruin.

**AZA'LEA.** A genus of plants, nat. ord. Ericaceæ, or heaths, remarkable for the beauty and fragrance of their flowers, and distinguished from the rhododendrons chiefly by the flowers having five stamens instead of ten. Many beautiful rhododendrons with deciduous leaves are known under the name of *azalea* in gardens. The azaleas are common in North America, and two species of these—*A. viscōsa* and *A. nudiflōra*—are well known in Britain. An Asiatic species, *A. pontica*, famous for the stupefying effect which its honey is said to have produced on Xenophon's army (cf. *Anabasis*, book iv., chap. 8), is also common in British gardens and shrubberies; and another, *A. indica*, is a brilliant greenhouse plant.

**AZAMGARH,** or **AZIMGARH.** A town of India, United Provinces, capital of district of same name. Pop. 11,000.—The district has an area of 2418 sq. miles; a pop. of 1,530,000.

**AZEGLIO** (äd-zel'yō), **Massimo Taparelli, Marquis d'.** An Italian "admirable Crichton," artist, novelist, publicist, statesman, and soldier, born at Turin in 1798, died 1866.

After gaining some reputation in Rome as a painter, he married the daughter of Manzoni, and achieved success in literature by his novels *Ettore Fieramosca* (1833) and *Niccolo dei Lapi* (1841). These embodied much of the patriotic spirit, and in a short time he devoted himself exclusively to fostering the national sentiment by personal action and by his writings. Many of the reforms of Pius IX. were due to him. He commanded a legion in the Italian struggle of 1848, and was severely wounded at Vincenza. Chosen a member of the Sardinian Chamber of Deputies, he was, after the battle of Novara, made president of the cabinet, and in 1859 appointed to the military post of general and commissioner-extraordinary for the Roman States.

**AZERBAIJAN.** A province of North-Western Persia; area, 40,000 sq. miles; pop. estimated at 2,000,000. It consists generally of lofty mountain ranges. The principal river is the Araxes, which enters the Caspian. Agricultural products are wheat, barley, maize, fruit, cotton, tobacco, and grapes. Chief minerals are iron, lead, copper, salt, saltpetre, and marble. Tabriz is the capital; pop. 200,000.

**AZERBAIJAN.** A Socialist Soviet Republic proclaimed in 1918. It includes the former Russian provinces of Baku and Elizavetpol, on the coast of the Caspian Sea. Since 1922 Azerbaijan has, with Armenia and Georgia, formed a federation known as the Trans-Caucasian Socialist Soviet Republic. The petroleum industry is most important, and agriculture, sericulture, cotton, and fisheries are capable of great development. Baku is the capital. Area, 33,640 sq. miles; pop. 2,313,172, of which number 75 per cent are Turco-Tatars. *See* RUSSIA (*table*).

**AZ'IMUTH.** Of a heavenly body, the arc of the horizon comprehended between the meridian of the observer and a vertical circle passing through the centre of the body. The azimuth and altitude give the exact position of the body with reference to the horizon.

**AZINCOURT.** *See* AGINCOURT.

**AZO COMPOUNDS.** A class of substances which belong to the benzene series and contain carbon, hydrogen, and nitrogen. All azo compounds are highly coloured, and in some cases they are direct cotton dyes. The simplest azo compound is *azobenzene*, the chemical formula of which is $C_6H_5-N=N-C_6H_5$. It is prepared from nitrobenzene by reducing it with stannous chloride and sodium hydroxide. Azobenzene is a highly-coloured crystalline substance, but it is not a dye; it forms, however, the basis of the dyes known as *azodyes*. The azodyes form one of the largest groups of dyes, and derive their name from the presence of the characteristic chemical group $-N=N-$, known as the *azo* group. Azo compounds may become exceedingly complicated in structure. They are divided into mon-azo, di-azo, tri-azo compounds according to the number of azo groups present. The well-known dyes Congo Red and Bismarck Brown are azo compounds of complicated structure. Azo dyes were discovered by Griess in 1856, but as a class did not come on the market until about 1876.

**AZOF.** *See* AZOV.

**AZO'IC.** *See* PRE-CAMBRIAN.

**AZOIMIDE, or HYDRAZOIC ACID.** $N_3H$, is an acid liquid of disagreeable odour, producing headache if inhaled. The acid itself and its salts, with the exception of the alkali salts, are exceedingly explosive and dangerous to handle. Lead hydrazoate, $PbN_6$, is one of the most stable of these salts. It is a more powerful explosive than mercury fulminate, and has been used instead, in the manufacture of detonators.

**AZORES** (a-zōrz' or a-zō'res), or **WESTERN ISLANDS.** A group belonging to and 900 miles west of Portugal, in the North Atlantic Ocean. They are nine in number, and form three distinct groups—a N.W., consisting of Flores and Corvo; a central, consisting of Terceira, São Jorge, Pico, Fayal, and Graciosa; and a S.E., consisting of São Miguel (or St. Michael) and Santa Maria. The total area is 922 sq. miles; São Miguel (containing the capital Ponta Delgada), Pico and Terceira are the largest.

The islands, which are volcanic and subject to earthquakes, are of comparatively recent origin, and are conical, lofty, precipitous, and picturesque. The most remarkable summit is the peak of Pico, about 7600 feet high. There are numerous hot springs. They are covered with luxuriant vegetation, and diversified with woods, cornfields, vineyards, lemon and orange groves, and rich, open pastures. The mild and somewhat humid climate, combined with the natural fertility of the soil, brings all kinds of vegetable products rapidly to perfection, among the most important being grain, oranges, pineapples, bananas, potatoes, yams, beans, coffee, and tobacco.

The inhabitants are mainly of Portuguese descent, indolent and devoid of enterprise. Principal exports: wine and brandy, oranges, maize, beans, pineapples, cattle. The climate is recommended as suitable for consumptive patients. The Azores were discovered by Cabral about 1431, shortly after which date they were taken possession of and colonized by the Portuguese. When first visited they were uninhabited, and had scarcely any other animals except birds, particularly hawks, to which, called in Portuguese *açores*, the islands owe their name. Pop. 232,012.

**AZ'OTE.** A name formerly given to nitrogen; hence substances containing nitrogen and forming part of the structure of plants and animals are known as *azotized* bodies. Such are albumen, fibrine, caseine, gelatine, urea, kreatine, etc. *See* NITROGEN.

**A'ZOV,** or **ASOV.** A town in the Russian government of Ekaterinoslav, upon an island at the mouth of the Don, where it flows into the Sea of Azov; formerly a place of extensive trade, but its harbour has become almost sanded up. Pop. 31,111.

**AZOV, SEA OF** (ancient, **PALUS MŒŌTIS**). An arm of the Black Sea, with which it is united by the Straits of Kertch or Kaffa; length about 170 miles, breadth about 80 miles; greatest depth not more than 8 fathoms. The W. part, called the Putrid Sea, is separated from the main expanse by a long sandy belt called Arabat, along which runs a military road. The sea teems with fish. The Don and other rivers enter it, and its waters are very fresh.

**AZPEITIA** (ath-pā'i-ti-a). A town of N.E. Spain, province Guipuzcoa. Near it is the convent of Loyola, a large edifice, now a museum. Pop. 6692.

**AZ'RAEL.** *See* AS'RAEL.

**AZ'TECS** (from *Aztatl* (heron), and *Flacatl* (man), "people of the heron"). A race of people who settled in Mexico early in the fourteenth century, ultimately extended their dominion over a large territory, and were still extending their supremacy at the time of the arrival of the Spaniards, by whom they were speedily subjugated. Their political organization, termed by the Spanish writers an absolute monarchy, consisted of a military chief exercising important, but not unlimited, power in civil affairs, in which the council of chiefs and periodic assemblies of the judges had also a voice. Their most celebrated ruler was Montezuma, who was reigning when the Spaniards arrived, about the middle of the fifteenth century. It is inferred that considerable numbers of them lived in large communal residences, and that land was held and cultivated upon the communal principle. Slavery and polygamy were both legitimate, but the children of slaves were regarded as free.

Although ignorant of the horse, ox, etc., they had a considerable knowledge of agriculture, maize and the agave being the chief produce. Silver, lead, tin, and copper were obtained from mines, and gold from the surface and river beds, but iron was unknown to them, their tools being of bronze and obsidian. Metal coins were not in use. In metal-work, feather-work, weaving, and pottery they possessed a high degree of skill. To record events they used picture-writing, and their lunar calendars were of unusual accuracy.

Two special deities claimed their reverence: Huitzilopochtli, the god of war, propitiated with human sacrifices; and Quetzalcoatl, the beneficent god of light and air, with whom at first the Aztecs were disposed to identify Cortez. Their temples, with large terraced pyramidal bases, were in the charge of an exceedingly large priesthood, to whom the education of the young was entrusted. As a civilization of apparently independent origin, yet closely resembling in many features the archaic Oriental civilizations, the Aztec civilization is of the first interest, but in most accounts of it a large speculative element has to be discounted.

**AZ'ULINE,** or **AZ'URINE.** Blue dyes belonging to the coal-tar class.

**A'ZURE.** The heraldic term for the colour blue, represented in engraving by horizontal lines.

**AZ'URINE** (*Leuciscus cæruleus*). A fresh-water fish of the same genus as the roach, chub, and minnow, found in some parts of Europe, but rare in Britain; called also *Blue Roach.*

**AZ'URITE.** A blue mineral, a carbonate of copper, often occurring in crystals. Its formula is $2CuCO_3 \cdot Cu(OH)_2$, and it is also called *Blue Malachite.* Also a name of lazulite.

**AZYMITE.** *See* EUCHARIST.

# B

**B.** Is the second letter and the first consonant in the English and most other alphabets. It is a mute and labial, pronounced solely by the lips, and is distinguished from *p* by being sonant, that is, produced by the utterance of voice as distinguished from breath.

**B.** In music, the seventh note of the model diatonic scale or scale of C. It is called the leading note, as there is always a feeling of suspense when it is sounded until the keynote is heard.

**BAADER, Franz Xaver von** (fränts-zä'fer fon bä'der). German philosopher and theologian, born in Munich, 1765, died 1841. He studied engineering, became superintendent of mines, and was ennobled for services. He was deeply interested in the religious speculations of Eckhart, St. Martin, and Böhme, and in 1826 was appointed professor of philosophy and speculative theology in the University of Munich. During the last three years of his life he was interdicted from lecturing for opposing the interference in civil matters of the Roman Catholic Church.

**BA'AL,** or **BEL.** A Semitic word, which primarily signified lord or proprietor, and was afterwards applied to many different divinities, or, with qualifying epithets, to the same divinity regarded in different aspects, describing him as an occupier of some physical object or locality, or as a possessor of some attribute. Thus in Hos. ii. 16 it is applied to Jehovah himself, while *Baalberith* (the Covenant-lord) was the god of the Shechemites, and *Baal-zebub* (the Fly-god) the idol of the Philistines at Ekron. Baal was the sacred title applied to the Sun as the principal male deity of the Phœnicians and their descendants, the Carthaginians, as well as of the ancient Canaanitish nations, and was worshipped as the supreme ruler and vivifier of nature. The word enters into the composition of many Hebrew, Phœnician, and Carthaginian names of persons and places; thus, *Jerubaal*, *Hasdrubal* (help of Baal), *Hannibal* (grace of Baal), and *Baal-Hamnon*, *Baal-Thamar*, etc.

**BAALBEK'** (ancient, **HELIOPŎLIS,** "city of the sun"). A place in Syria, in a fertile valley at the foot of Antilibanus, 40 miles from Damascus, famous for its magnificent ruins. Of these the chief is the Temple of the Sun, built either by Antoninus Pius or by Septimius Severus. Some of the blocks used in its construction are 60 feet long by 12 thick; and its fifty-four columns, of which six are still standing, were 72 feet high and 22 in circumference. Near it is a temple of Jupiter, of smaller size though larger than the Parthenon at Athens, and there are other structures of an elaborately ornate type. Originally a centre of Sun-worship, it became a Roman colony under Julius Cæsar, was garrisoned by Augustus, and acquired increasing renown under Trajan as the seat of an oracle. Under Constantine its temples became churches, but after being sacked by the Arabs in 748, and more completely pillaged by Tamerlane in 1401, it sank into hopeless decay. The work of destruction was completed by an earthquake in 1759.

**BAAL-ZEBUB.** *See* BEELZEBUB.

**BABA.** A cape near the north-west point of Asia Minor.

**BABADAGH** (bä-bä-däg'). A town of Romania, capital of the Dobrudja, carrying on a considerable Black Sea trade; it was bombarded by the Russians in 1854. Pop. 10,000.

**BAB'BAGE, Charles.** English mathematician and inventor of the calculating-machine, born 1792, died 1871. He graduated at Cambridge in 1814, and occupied the Lucasian chair of mathematics at Cambridge for eleven years, but delivered no lectures. As early as 1812 he conceived the idea of calculating numerical tables by machinery, and in 1823 he received a grant from Government for the construction of such a machine. After a series of experiments lasting eight years, and an expenditure of £17,000 (£6000 of which was sunk by himself, the balance voted by Government), Babbage abandoned the undertaking in favour of a much more enlarged work, an analytical engine, worked with cards like the jacquard-loom; but the project was never completed.

The incompleted machine is now in the South Kensington Museum. Among the many treatises he published on subjects connected with mathematics and mechanics few can be regarded as finished performances. Babbage was instrumental in founding the Astronomical and Statistical Societies (1820 and 1834).

**BABBIT-METAL.** A soft metal resulting from alloying together certain proportions of copper, tin, and zinc or antimony, used with the view of as far as possible obviating friction in the bearings of journals, cranks, axles, etc., invented by Isaac Babbit (1799-1862), a goldsmith of Taunton, Massachusetts.

**BA'BEL.** *See* BABYLON.

**BA'BEL, Tower of.** According to the 11th chapter of Genesis, a structure in the Plain of Shinar, Mesopotamia, commenced by the descendants of Noah subsequent to the deluge, but which was not allowed to proceed to completion. It has commonly been identified with the great temple of Belus, or Bel, that was one of the chief edifices in Babylon, and the huge mound called Birs Nimrud is generally regarded as its site, though another mound, which to this day bears the name of Babil, has been assigned by some as its site. Babel means literally "gate of God." The meaning "confusion" assigned to it in the Bible really belongs to a word of similar form. *See* BABYLON.

**BAB-EL-MANDEB** ("gate of tears," from being dangerous to small craft). A strait, 15 miles wide, between the Indian Ocean and the Red Sea, formed by projecting points of Arabia in Asia, and Abyssinia in Africa. The Island of Perim is here.

**BA'BER.** First Grand Mogul, the founder of the Mogul dynasty in Hindustan, born in 1483, died 1530. He was a grandson of the great Tartar prince, Timur or Tamerlane, and was sovereign of Cabul. He invaded Hindustan, and in 1525 overthrew and killed Sultan Ibrahim, the last Hindu emperor of the Pathan or Afghan race. He made many improvements, social and political, in his empire, and left a valuable autobiography (English translation, 1826).

**BABEUF** (bà-beuf), **François Noel.** A French political agitator, born in 1764; started a democratic journal in Paris, called *Le Tribun du Peuple, par "Gracchus" Babeuf*, and wrote with great severity against the Jacobins.

Family of Common Baboons (*Cynocephalus babouin*).

After the fall of Robespierre, to which he powerfully contributed, he openly attacked the terrorists, and advocated the most democratic principles. He was accused of a conspiracy against the directorial Government, condemned to death, and guillotined in 1797. He was one of the pioneers of Socialism in France.

**BAB'INGTON, Anthony.** A Catholic gentleman of Derbyshire, born 1561. He associated with others of his own persuasion to assassinate Queen Elizabeth, and deliver Mary, Queen of Scots. The plot being discovered, the conspirators were executed in 1586.

**BABIROUSSA.** *See* BABYROUSSA.

**BAB'ISM.** The doctrines of a Mohammedan sect whose headquarters is Persia, founded by Seyd Ali Mohammed in 1844. He took the name of Bab-ed-din, "the gate of the faith," and afterwards that of Nokteh, "the point," as not merely the recipient of a new divine revelation, but the focus in which all preceding dispensations would converge. One of his most successful disciples was a highly-gifted woman, Gurred-ul-Ayn, "consolation of the eyes," who perished with many others during a persecution in 1852. The Bab himself had been executed about two years before this, and was succeeded by a noble youth, Mirza Yahya.

The sect holds that all individual existence is an emanation from the supreme deity, by whom it will be ultimately reabsorbed. The morality of the sect is pure and cheerful, and it shows great advancement in the treatment of woman. Moses, Christ, and Mohammed are acknowledged as prophets, though only mere precursors of the Bab. A schism divided the followers of Babism into two sects, Bahais and Ezelis. The former have carried on an active propaganda in America.

**BA'BOO,** or **BABU.** A Hindu title of respect equivalent to *sir* or *master*, usually given to wealthy and educated native gentlemen, especially when of the mercantile class.

**BABOON'.** A common name applied to a division of old-world quadrumana (apes and monkeys), comprehending the genera Cynocephálus and Papio. They have elongated abrupt muzzles like a dog, strong tusks or canine teeth, usually short tails, cheek-pouches, small, deep eyes with large eyebrows, and naked callosities on the buttocks. Their hind and fore feet are well proportioned, so that they run easily on all fours, but they do not maintain themselves in an upright posture with facility. They are generally of the size of a moderately large dog, but the largest, the mandrill, is, when erect, nearly of the height of a man.

They are almost all African, ugly, sullen, fierce, lascivious, and gregarious, defending themselves by throwing stones, dirt, etc. They live on fruits and roots, eggs and insects. They include the chacma, drill, common baboon, and mandrill. The chacma or pig-tailed baboon (*Cynocephálus porcarius*) is found in considerable numbers in parts of the S. African colonies, where the inhabitants wage war against them on account of the ravages they commit in the fields and gardens. The common baboon (*C. babouin*) inhabits a large part of Africa farther to the north. It is of a brownish-yellow colour, while the chacma is greyish-black, or in parts black. The hamadryas (*C. hamadryas*) of Abyssinia is characterized by long hair, forming a sort of shoulder-cape. The black baboon (*C. niger*) is found in Celebes.

**BABOUR** (bä'bŭr). *See* BABER.

**BAB'RIUS.** A Greek poet who flourished during the second or third century of the Christian era, and wrote a number of Æsopian fables. Several versions of these made during the Middle Ages have come down to us as Æsop's Fables. In 1840 a manuscript containing 120 fables by Babrius, previously unknown, was discovered on Mount Athos.

**BABUYA'NES ISLANDS.** A group in the Pacific Ocean, between Luzon and Formosa, belonging to United States. Pop. 12,000.

**BABY-FARMING.** The law relating to the protection of children and young persons has been subjected to amendment and consolidation by the Children Act of 1908, which wholly repealed the Infant Life Protection Act of 1897 dealing with baby-farming and infant life protection.

The Act of 1908 (Part I.) deals with baby-farming, and requires that notice shall be given to the Local Authority (in Scotland the Parish Council) by the person undertaking for reward the nursing and maintenance of any infant or infants under seven years of age apart from their parents, within forty-eight hours after reception, unless the period for which it is received be only forty-eight hours or less. The notice requires the name, sex, date and place of birth of the child to be stated, where it is to be kept, and from whom it is received. The Act also provides that such a person shall notify any change in his residence or the removal or death of the infant to the Local Authority

within forty-eight hours. In regard to all these matters the Act is retrospective, and necessitates persons who had undertaken nursing and maintenance of such infants before its coming into operation to comply with its provisions within a month after the commencement thereof. But it exempts any person who may have given the similar notice required by the Infant Life Protection Act of 1897, although it does not exempt any person whose duty it was to have given notice thereunder from any liability which such a person may have incurred thereunder.

A duty is imposed upon Local Authorities to inquire regarding persons willing to undertake the nursing and maintenance of infants, to appoint infant-protection visitors of either sex in so far as it provides for infant life protection and gives powers to such Local Authorities and visitors for fulfilling the requirements of the Act. It is an offence for the person undertaking the nursing to refuse to allow such visitors access to the infant or the premises in which it is kept; and, if need be, application may be made to the court for a warrant to enter the house in which an infant is farmed out, and where there is reason to believe that the Act is being contravened. It is an offence for any infant to be kept (1) by any person from whose care an infant has been removed under the Act or the Infant Life Protection Act, or (2) by any person convicted of any offence under Part II. of the Children Act of 1908 or the Prevention of Cruelty to Children Act, 1904.

The Local Authority may fix the number of infants under the age of seven years which may be kept in any dwelling, and it is an offence to keep more. Provision is also made for the removal of an infant from overcrowded, dangerous, or insanitary premises, or from the custody of a person unfit to take charge of the child; and an application may be made by a visitor to a magistrate for a removal order enforceable by the visitor or a constable. Should the infant die, notice of the fact must be given by the person with whom it is farmed out to the Procurator-fiscal of the district, if in Scotland, and, if in England, to the Coroner of the district, within twenty-four hours. He shall hold an inquest unless a certificate by a medical practitioner specifying the cause of death shall be forwarded. Failure to give such notice is punishable under the Act.

A person nursing an infant for reward shall have no interest in the life of the child for the purposes of life assurance. It is not permissible for such a person or insurance company to insure the life of such a child. To do so renders both the person and the insurance company liable to prosecution.

Any person knowingly or wilfully making any false statement in any notice required to be given under the Act commits an offence under the Act.

Imprisonment for a term not exceeding six months, or a fine not exceeding £25, may be imposed upon any person found guilty upon summary conviction of an offence against Part I. of the Children Act, 1908; in addition the court may order the removal of the infant to a place of safety. All fines are payable to the Local Authority for the purposes of the Act.

Legal guardians of an infant, as well as institutions established for the protection and care of infants, are exempted from the provisions of Part I. of the Children Act. 1908.

**BAB'YLON.** The capital of Babylonia, on the left of the Euphrates, one of the largest and most splendid cities of the ancient world, now a scene of ruins, and earth-mounds containing them. Babylon was a royal city sixteen hundred years before the Christian era; but the old city was almost entirely destroyed in 683 B.C. A new city was built by Nebuchadnezzar nearly a century later. This was in the form of a square, each side 15 miles long, with walls of such immense height and thickness as to constitute one of the wonders of the world. It contained splendid edifices, large gardens and pleasure-grounds, especially the "hanging-gardens," a sort of lofty terraced structure supporting earth enough for trees to grow, and the celebrated Tower of Babel or Temple of Belus, rising by stages to the height of 625 feet. (*See* BABEL, TOWER OF.) After the city was taken by Cyrus in 538 B.C., and Babylonia made a Persian province, it began to decline, and had suffered severely by the time of Alexander the Great. He intended to restore it, but was prevented by his death, which took place here in 323 B.C., from which time its decay was rapid.

Interesting discoveries have been made on its site, more especially of numerous and valuable inscriptions in the cuneiform or arrow-head character. The modern town of Hillah is believed to represent the ancient city, and the plain here for miles round is studded with vast mounds of earth and brick and imposing ruins. The greatest mound is Birs Nimrud, about 6 miles from Hillah. It rises nearly 200 feet, is crowned by a ruined tower, and is

commonly believed to be the remains of the ancient Temple of Belus. Another great ruin-mound, called Mujellibeh, has also been assigned as its site.

**BABYLONIA and ASSYRIA.** These ancient seats of Mesopotamian civilization lay across the western Asian trade routes, Babylonia being in the south and Assyria in the north. The area in which they flourished is embraced by the Rivers Tigris and Euphrates, and extends from the head of the Persian Gulf to the frontiers of Armenia and Northern Syria, is bordered on the east by Persia and on the west by the Syro-Arabian desert. "Mesopotamia" is a term borrowed by the ancient Greeks from the Semites, and was first applied to the north-western region. There was a Roman province of that name.

**Physical Features.** The northern area of the Tigro-Euphrates valley is partly mountainous and partly steppe land, with wide stretches of elevated grazing lands and fertile districts on the banks of rivers. Assyria, derived from A-usar ("the river-bank region"), had origin in north-eastern Mesopotamia. Its most ancient capital, Asshur (modern Kal'at Sherkat), was situated on the western bank of the River Tigris, between the tributaries the Upper Zab and the Lower Zab. Nineveh, the last capital of all, lay farther north on the eastern bank of the Tigris, and right opposite modern Mosul. The Assyrians called themselves Asshurai, and their national god was Ashur (earlier Ashir), written A-Shur, but confused in time with Ash-Shur, the name of the capital.

The southern area of Mesopotamia, below Bagdad, where the Tigris and Euphrates come within 35 miles of one another, is a flat alluvial plain. Babylonia proper is that fish-shaped region between the rivers, which broadens out to about 100 miles and gradually narrows to the point at Kurnah where the rivers meet and form the Shatt-el-Arab. From Kurnah to the head of the Persian Gulf is the ancient area of Chaldea, which means "Sea-land." The inhabitants called themselves Kaldu (Sea-landers) and were known to the Hebrews as the Kasdim, and to the Greeks as the Chaldaioi. Babylonia, and the rest of the alluvial plain, is the "gift" of the rivers which rise in flood each year when the snow melts on the Armenian mountains.

**Rivers.** Both the Tigris and the Euphrates bring down enormous quantities of sediment—indeed, five times as much as does the Egyptian Nile—and they have withal more destructive tendencies. The accumulating silt tends to divert the flow of the rivers in the south, and a process of land-making which began at the close of the Ice Age is still in progress, thrusting back the head of the Persian Gulf. At one time the Tigris and Euphrates entered the gulf by separate mouths, and Chaldea was then a narrow fringe of steppe land, plain, and marshes. The River Tigris is about 1146 miles long, and begins to rise early in March, reaching its height in May, and subsiding before the end of June. The Euphrates is a slower river, about 1780 miles in length. It begins to rise a fortnight later than the Tigris, is longer in flood, and does not reach its lowest level until September. As there is a drop of only 120 feet between Bagdad and the sea, a distance, as the crow flies, of about 300 miles, the ancient Babylonians did their utmost to conserve the water which came down in such abundance and was rapidly drained away, after doing much damage.

Near Bagdad the Tigris is on a higher level than the Euphrates, and could be run into it through a canal; farther south the Euphrates, being on the higher level, could be run by canal into the Tigris. The ancient engineers cut these and other canals; indeed, they covered the whole valley with a network of them. To store the Euphrates water for the season of drought and great heat, they formed canals which carried the roaring flood into two depressions in the western desert between the modern towns of Kerbela and Ramâdi. These depressions are utilized for the British irrigation scheme. The Babylonians did their utmost to control the Tigris by erecting earthen dams so as to hold up as much of the water as possible. Earthen dykes were also erected to raise its banks. The right bank protected the farms from disastrous flooding.

**Commercial and Cultural Development.** These ancient irrigation works made Babylonia the greatest grain-yielding area in the ancient world. Its vast surplus of food stimulated trade and brought Babylonia immense wealth, while its strategic situation made it very powerful. Its cultural influence flowed along the trade routes eastward across Persia and the Iranian plateau, northward through Assyria to Armenia (ancient Urartu) and beyond, and north-westward along the Euphrates banks into Syria and Palestine, and into Asia Minor, the land of the Hittites, and then along the highway to Europe, called later by the Persians "the royal road." The road to Egypt ran southward from North Syria through Palestine,

skirting the maritime valley by "the way of the Philistines." The merchants of many nations met in the city of Babylon, the London of the ancient western Asian world, and in the trading centres of North Syria, including Carchemish.

**History.** The earlest agriculturists and traders of Babylonia were the Sumerians, a non-Semitic people, who built a number of cities in the irrigated valley and founded colonies in Assyria. No trace has been found of a Neolithic Age in Babylonia. Its civilization, so far as our knowledge goes, began after copper was introduced. At an early period Semites filtered into the valley. They absorbed Sumerian civilization, and ultimately became politically predominant in the northern part of the valley, which was called Akkad (the biblical Accad). The southern part was then known as Sumer or Sumeria (the biblical "Plain of Shinar"). Akkad embraced the city States of Agade, Babylon, Borsippa, Sippar, Kish, Opis, and Kutha. The Sumerian city States included Eridu, Ur (later "of the Chaldees" and the birthplace of Abraham), Lagash, Shuruppak, Erech, Umma, and Adab.

Inter-state wars resulted time and again in the formation of confederacies which were more of political than racial character, and the predominance of one city or another. Religious ideas were fused, and local pantheons appear to have reflected local politics. The chief seat of early Sumerian civilization was the city of Eridu, a name signifying "on the seashore." Its site is marked by modern Abu-Shahrein on the eastern bank of the Euphrates, and southeast of Ur, modern Mukayyar. Eridu was originally a scaport on the Persian Gulf, from which it is now separated by about 125 miles of land formed by river silt.

The chief god of Eridu was Ea, a name also rendered Ae and Aa, and apparently meaning "waters" or "house (region) of waters." That the term "waters" had a special significance for the inhabitants of a water-formed land is evident by the fact that the Semitic equivalent of Ea is Enki, which means "lord of earth." Other titles of the god were "lord of Heaven and Earth," "ruler of the land," "the deep," "god of the abyss," and "king of the river." He was withal the "Creator," water having created Sumeria, and Nadimmud, "lord of everything," as the Egyptian Osiris in his character of god of the Nile was "Neb-er-Zer," also "lord of everything." Ea had a ship with a crew including his son Marduk (Merodach or Marad, the Nimarad or Nimrod of legend) and Iuab, "the pilot of Eridu." The ship was hailed, in religious literature, as the bringer of fertility and joy. Evidently the beginning of Sumerian civilization had some connection with ancient seafarers. Of special interest in this connection are the references made by the Greek writer Berosus to Oannes, a sea-dweller who came daily from the Persian Gulf to instruct the early Babylonians how to irrigate the land, grow crops, erect houses, make laws, write, calculate and measure, and engage in trade. Texts have been discovered which tend to identify Oannes with the god Ea. As the early Sumerians bore a strong physical resemblance to the ancient Egyptians, and there were links between the early religious beliefs and customs of the two peoples, it is suspected that they represented two branches of the same ancient stock. Some think Sumerian civilization was founded by colonists from Egypt, while others believe that Egyptian civilization was stimulated by settlers from Sumeria. The question as to who first invented ships has an important bearing in this connection.

**Myths.** When we turn to Sumero-Babylonian religious myths we find that some reflect local natural phenomena. In one the Euphrates is hailed as the River (god) "who didst create all things." Another, referring to the creation of man, says that Marduk (earlier the god Gilimma) "tied reeds on the face of the waters, he formed dust and poured it out beside the reeds . . . he formed mankind." Another version is that man was created from the god's blood and bone, or, as Berosus has it, from the god's blood and earth. The oldest Sumerian creation myth states that all things came from primeval water. Then many deities were created by the pre-existing triad of gods, Anu (the sky-god), Enlil ("the elder Bel," the earth-god, and "lord of grain"), and Ea, who was associated with the goddess Ninkharsagga. Ea had several other wives, including Ninshar or Ninkurra, Ninella, Nintu, and Damkina. These goddesses were ultimately all absorbed by Ishtar, the Semitic name of the love and mother goddess.

In the later Babylonian "Seven Tablets" version of the creation myth a conflict is introduced. The female chaos-dragon Tiamat is slain by Marduk, the chief god of Babylon, "the later Bel," who cuts up her body and uses part to form the sky and part to keep the waters in their place. After a time a deluge took place. In the Sumerian myth a priest-king called Ziusudu (earlier named Tatug or Uttu) corresponds both to Adam

and to Noah, and builds a large vessel, having been warned by Ea of the approaching disaster. The Gilgamesh Epic refers to the hero as Ut-napishtim (or Pir-na-pishtim). He and his wife afterwards become immortal, and they are visited on their island by Gilgamesh (the Babylonian Hercules), when, smitten by disease, he searches for the Plant of Life, which he finds and afterwards loses.

Ishtar, the goddess who plays a part in this epic, is also the heroine of the poetic legend which tells of her descent to Hades in quest of Tammuz, whose story resembles somewhat that of Adonis and has Osirian characteristics. The Babylonian Persephone was Eresh-ki-gal with whom Tammuz dwelt in her underworld for part of the year. Associated with her was Nergal, chief god of Kutha, whose planet was Mars. He conquered Hades. He and other city gods appear to have been developed from attributes vaguely shared by the earlier triad Anu, Bel-Enlil, and Ea. The moon-god of Ur was Sin (Sumerian Nannara), whose name clings to the desert of Sinai. Shamash was the Semitic name of the sun-god Sippar, the Sumerian being Utu; Gishnu, the Light, and Ma-banda-anna, "the boat of heaven" (like the Egyptian Ra), and Mitra were among his other non-Semitic names. Dagan, the god of the Euphrates, is regarded as a form of Ea, and as probably the same deity as Dagon of the Philistines. In later times the astrologers coloured with their doctrines the religious beliefs of Babylonia.

**Empire Builders.** Among the early empire-builders of Babylonia were Lugal-zaggisi of Sumerian Erech, who claimed to have subdued all lands from the Lower Sea (Persian Gulf) to the Upper Sea (the Mediterranean). He flourished about 2800 B.C. Another was Sargon of Akkad, who lived about a century and a half later. He must not be confused with the much later biblical Sargon of Assyria. His son or grandson, Naram-Sin, recorded his great trading activities and victories over his enemies, including the Elamites, whose chief stronghold was Susa in south-western Persia. Elam was a rival power of considerable strength. About 2200 B.C. it had overrun a great part of Sumeria, and Akkad fell to the invading bands of Amorites. These Amorites founded the Hammurabi Dynasty, of which the king of that name was sixth in succession; Hammurabi extinguished the last sparks of Elamite power in Sumeria, which, with Akkad, was united to form the kingdom of Babylonia, named after Babylon, the capital. It was during this period that Abraham migrated from Ur to Palestine.

Hammurabi (*c.* 2123-2081 B.C.) codified the ancient Sumerian laws and did much to develop trade. The chief god of his kingdom was Marduk, "the later Bel," whose temple was called Esagilla. Babylon became the greatest trading centre in Western Asia and a rival of the Egyptian Memphis. Sumerian gradually ceased to be a spoken language, being supplanted by Semitic, but remained, like Latin, in mediæval Europe, the language of law, culture, and religion, while the Babylonian language became the language of trade and diplomacy, and was used in international correspondence by all the great Powers. The Hammurabi dynasty came to an end about 1926 B.C., when the Hittites raided Babylonia and carried off the statues of Marduk and his consort. Kassites, assisted by Elamites, had been attacking Babylonia from the east, and the Sealanders, who were Arabians mixed with Sumerians, established their independence.

In the end the Kassites, who were probably Aryan by race, conquered Babylonia and established a new dynasty. Like the Trojans they were "tamers of horses." Their military successes are believed to have been due to the use of the horse, which was a rarity in Babylonia before their time, but became common as a beast of burden as soon as the Kassite dynasty was established. Kassite supremacy lasted for over 570 years, and during that period Babylonia was known as Karduniash. One of its early kings brought back from Khani (Mitanni) the statues of Marduk and his consort which had been carried off by the Hittites. Babylonian civilization was not changed by Kassite conquest, and its trade went on as of yore. The Kassites formed an aristocracy like the Normans in England.

During the Kassite period Assyria was a growing power. It had origin as a Sumerian colony, but above the relics of the Sumerians at Asshur have been found those of a people whose kings had such non-Semitic and probably Aryan names as Ushpia, Kikia, and Adasi. The Amorites afterwards swept into Assyria, which they Semitized. During the Hammurabi dynasty it was subject to Babylonian overlordship. It grew independent during the latter period of the Kassite dynasty, and its kings formed compacts with the Kassites. Their western neighbours were by this time the Mitannians. An Aryan military aristocracy had formed a powerful State in north-western Mesopotamia, where they worshipped Indra, Varuna, and

Mitra, gods which figure in the mythology of the Aryan invaders of India. Egypt, under Thothmes III., extended her Syrian empire to the borders of Mitannia and a friendship sprang up between the two Powers. Assyria was during the period subject to Mitanni. The Tell-el-Amarna letters reveal the fact that Egyptian monarchs had married princesses from Mitanni, and the famous Akhenaton had Mitannian blood in his veins.

The Hittites conquered Northern Syria and overran Mitannia when the Egyptian Asian empire went to pieces. Assyria then became powerful and independent again, the first great king of its new age being Ashur-uballit, who was strong enough to interfere with Babylonia's domestic politics. Shalmaneser I. of Assyria (*c.* 1300 B.C.) conquered the whole of the Mitanni kingdom and extended the Assyrian empire westward across the Babylonian caravan road to North Syria. He built a new capital at Kalah (Nimrud). His son, Tulkulti—Nineb I.—(*c.* 1275 B.C.), conquered Babylonia and reigned over it for seven years. In the end he was murdered by political conspirators, with whom his son was associated. Civil war ensued, and Assyria's history is found to be obscure for a century afterwards. In Babylon the Kassite dynasty, under which trade flourished, came to an end as a result of an Elamite invasion about 1185 B.C. A new Babylonian dynasty then arose, and the third king, Nebuchadnezzar I., revived the old empire and waged war against Assyria.

But the future lay with Assyria, which was organized as a military State. It did not have Babylonia's natural resources, and could only exist as a great Power by imposing tribute on weaker States. A standing army was the basis of its strength. The national god was Ashur, who was symbolized by a winged disc, an adaptation of the Egyptian winged disc of Horus. It was carried to battle with the king, so that wherever the king was, there was the national god of war. The heavily-bearded Assyrians were a fiercer and more warlike people than the mild, shaven Babylonians, who were ever influenced by Sumerian modes of thought. The Assyrian temperament is reflected in its art, which at it best is characterized by vigorous realism and brilliant ferocity. Much of it is harsh, exaggerated, and pompous. A sharp contrast is presented by the calmer and more idealistic art of the Sumero-Babylonians.

The records of Assyrian monarchs deal mainly with extensive conquests. They did their utmost to set up a reign of terror in Western Asia, and when subject States revolted the chief men in them were flayed alive or impaled on stakes. The wholesale destruction of trading city States and the massacres of thousands of innocents were fit subjects for an Assyrian conqueror to boast of in his inscriptions. Hittites, North Syrians, Babylonians, and Urartians (Armenians), were time and again plundered and subjected. A great conqueror of the Middle Period was Tiglath-Pileser I. (*c.* 1100 B.C.), and other monarchs of the same name repeated his conquests and atrocities during the last century of Assyria's existence. The military glory of such a monarch as Ashurnatsir-pal III. (885-860 B.C.), whose armies swept through western Asia like cyclones, has a lurid background of savage cruelty and oppression. He fought for no greater cause than plunder and the maintenance of Assyria's ability to wring tribute from the oppressed. His son, Shalmaneser III., extended the empire but died under a cloud of internal revolt. Subsequent rulers dominated Babylonia, and one, Adad-nirari IV. (810-782 B.C.), married the Babylonian princess, Sammurammat, the Semiramis of tradition. Tiglath-Pileser IV. (745-727 B.C.) was overlord of Babylon, and, indeed, Babylonia was more or less under Assyrian sway for the next century.

Sargon II. ("Sargon the later")

Israelites before Shalmaneser. From the "Black Obelisk of Shalmaneser II."

did his utmost to break the national spirit in subject States by transporting whole communities from one to another. He removed a portion of the "ten lost tribes" to the Median hills, and dispatched Babylonians from Kutha to Samaria, where they made Nergal their chief god. His campaigns extended to Phœnicia, Cilicia, and Armenia. Sennacherib, his son, defeated Egypt and her allies in Palestine and besieged Hezekiah in Jerusalem. A revolution in Babylonia broke out, and he swept into it and devastated Babylon, so that Nineveh might become the chief city in Mesopotamia. But Babylon had to be rebuilt by his son Esarhaddon, so that its dislocated trade might be restored. Esarhaddon, recognising that the great commercial rival of Babylonia was Egypt, and that Egypt instigated the Palestinian and Syrian revolts against Assyria, invaded the Nile valley and captured and sacked Memphis.

Ashur-bani-pal (668-626 B.C.), the next Assyrian emperor, punished the Egyptian rebels by sweeping southwards and capturing and sacking Thebes, which is referred to as No (Nu-Amon) in the Bible (Nahum, iii. 8-10): "Populous No. . . . Yet was she carried away . . . her young children also were dashed in pieces at the top of all the streets: and they (the Assyrians) cast lots for her honourable men, and all her great men were bound in chains." Egypt became for a time an Assyrian province. Elam was similarly dealt with, the great capital Susa being treated like Thebes. On the north and east Assyrian power was established with characteristic Assyrian ferocity and thoroughness. The result was that the predatory nomadic tribes of Scythians and Medes were able to sweep through the devastated territories and strike at the very heart of the empire. Ashur-bani-pal was the last great monarch of Assyria. In private life he was cultured and scholarly, and his library, which contained copies of many ancient records and literary works, is one of the sources of Mesopotamian history. Although the Sardanapulus of Greek tradition, he was not the actual monarch who perished when Nineveh was captured and sacked about 606 B.C. by the fiery hillmen from the east. The Assyrian military organization collapsed and Assyria ceased to be.

The factors that led to the downfall of Assyria can only be guessed at. It may be that its many wars of conquest had left it in a state of exhaustion. It is also possible that the new generation of the aristocratic class that grew up in wealth and luxury was disorganized by intrigues and corruption. After Ashur-bani-pal died, no great leader arose, and the vast unwieldly empire suffered from internal decay.

Babylonia was the first to foster organized revolt. It was overrun by the Chaldeans from the south, who, two years after Ashur-bani-pal's death, set on the throne at Babylon their leader, King Nabopolassar. With him began the Neo-Babylonian dynasty which lasted for 86 years. He had an ambitious and capable son named Nebuchadnezzar, who set out, as soon as Nineveh fell, to seize the western portion of the Assyrian Empire—the Medes, with whom the Chaldeans had an agreement, being content to retain north-eastern Mesopotamia. The Egyptians, having overcome the Assyrian garrisons in the Nile valley, were by this time moving northward through Palestine with the idea of re-establishing their ancient empire in Asia. Memphis and Babylon were rival trading centres, and the struggle that ensued was one which was to decide which should have pre-eminence on the western Asian trade-routes, and especially the "clearing-houses" of North Syria.

In 604 B.C. Nebuchadnezzar met and defeated Pharaoh Necho's Egyptian army at Carchemish. The Egyptians retreated in confusion and were pursued to their frontier. Nabopolassar's death in Babylon caused Nebuchadnezzar to return home and ascend the throne. Eight years later, however, he was back in Palestine again. Judah had been plotting with Egypt, its ally, and the Babylonian monarch besieged and captured Jerusalem. Thousands of Jews were carried off as captives to Babylonia. In 587 B.C. Egypt involved Judah in a second revolt. Nebuchadnezzar II. again captured Jerusalem. This time he destroyed the city and carried away the greater part of the remnant of the Jewish people to serve his artisans and agriculturists "by Babel's streams."

Babylon was triumphant as a political and trading centre, and, during Nebuchadnezzar's long reign of 42 years, prospered greatly. Its products and its culture were carried far and wide, and Chaldean astrologers as well as merchants became known in Egypt and Greece. Babylonia was the birth place of the science of astronomy, which developed from astrology. Nebuchadnezzar was a great builder. It is the ruins of his Babylon that have been excavated in our own day. Although Greek descriptions of the city have been found to be somewhat exaggerated, it was yet made very strong and impressive. The royal palace was rebuilt, and the Hanging

Garden on its terraced platform became one of the seven wonders of the world. Trade flourished in the capital, and a harbour was built at the head of the Persian Gulf to promote sea traffic.

In 539 B.C. Cyrus, the Persian conqueror, having defeated the Babylonian army, entered Babylon in state and was welcomed by the priests, Nabo-nidus, the last king of the Neo-Babylonian empire, having made them his enemies. The independence of Babylonia then came to an end, but the importance of its capital as a trading centre did not suffer sudden decline. When it was captured by Alexander the Great in 331 B.C. it had been much damaged in consequence of revolts against Persia. The Macedonian conqueror resolved to make it his capital, but his early death, and subsequent political developments, hastened its decay. The Greeks had removed the rocks that blocked the Tigris, which then could be navigated by vessels from the Persian Gulf. Seleucus built the new capital of Seleucia on the right bank of the Tigris, and the traders followed the officials to the new Babylon. In time Ctesiphon arose on the left bank, and after the fall of the Parthian empire it was the principal city of the province.

The Moslem conquest of Mesopotamia in the seventh century of our era brought about the rise of Bagdad, a few miles to the north of Ctesiphon. It will be noted that all these cities are strategically situated in the neck of land, between the rivers, which is crossed by the caravan roads leading east and west. During the reign of the famous Harun al Rashid (786-809) Bagdad was at the height of its splendour. A portion of this ruler's great palace still remains, and the tomb of Zobiede, his queen, is a prominent feature on the outskirts of the city. Bagdad declined as a trading centre after Vasco da Gama discovered the sea-route to India, and diverted the merchandise previously carried to Europe across the overland routes across Persia and through Mesopotamia and Asia Minor. Bagdad afterwards depended chiefly on the traffic caused by pilgrim caravans to and from Mecca. The disastrous neglect of Babylonia's irrigation system occurred under Turkish rule.

Towards the close of the nineteenth century Germany obtained concessions from the Turks and planned the Bagdad railway, so as to reopen the ancient overland trade-route for Indo-Persian trade. British interests in the Persian Gulf were seriously threatened by this scheme. When war broke out in 1914, a British force landed in ancient Chaldea and pushed northward. Bagdad, the modern Babylon, was captured in 1917, and Mosul (Nineveh) was occupied in 1918. The Peace Treaty between the Allied Powers and Turkey placed Mesopotamia under the protection of Great Britain, which thus secured control of the Bagdad railway. An extensive irrigation scheme in the southern alluvial valley promises to restore ancient Babylonia to its importance as one of the great grain-yielding areas of the world.—BIBLIOGRAPHY: R. W. Rogers, *History of Babylonia and Assyria*; H. Winckler, *History of Babylonia and Assyria*; L. W. King and H. R. H. Hall, *Egypt and Western Asia in the Light of recent Discoveries*; P. S. P. Handcock, *The Latest Light on Bible Lands*; L. W. King, *History of Babylon*; D. A. Mackenzie, *Myths of Babylonia and Assyria*; T. G. Pinches, *The Religion of Babylon and Assyria*; *The Old Testament in the Light of the Records of Assyria and Babylonia*; A. H. Sayce, *Religions of Ancient Egypt and Babylonia*; M. Jastrow, *Aspects of Religious Belief and Practice in Babylonia and Assyria*; R. Koldeweg, *The Excavations of Babylon*.

**BABYROUSSA** (bab-i-rus'a; a Malay word signifying stag-hog). A species of wild hog (*Sus* or *Porcus Babyrussa*), a native of the Indian Archipelago. From the outside of the upper jaw spring two teeth 12 inches long, curving upwards and backwards like horns, and almost touching the forehead. The tusks of the lower jaw also appear externally, though they are not so long as those of the upper jaw. Along the back are some weak bristles, and on the rest of the body only a sort of wool. These animals live in herds, feed on herbage, are sometimes tamed, and their flesh is well flavoured.

**BAC'CARAT.** A gambling card game of French origin, played by any number of players, or rather betters, and a banker. The latter deals two cards to each player and two to himself, and covers the stakes of each with an equal sum. The cards are then examined, and according to the scores made the players take their own stake and the banker's, or the latter takes all or a certain number of the stakes.

**BACCARAT** (bàk-à-rà). A town of France, about 15 miles south-east of Lunéville, department Meurthe-et-Moselle, on the River Meurthe, with a handsome new church, and one of the largest works for plate-glass and crystal in France. Pop. 7277.

**BACCHANA'LIA,** or **DIONYSIA.**

Feasts in honour of Bacchus or Dionysus, characterized by licentiousness and revelry, and celebrated in ancient Athens. In the processions were bands of Bacchantes of both sexes, who, inspired by real or feigned intoxication, wandered about rioting and dancing. They were clothed in fawn-skins, crowned with ivy, and bore in their hands *thyrsi*, that is spears entwined with ivy, or having a pine-cone stuck on the point. These feasts passed from the Greeks to the Romans, who celebrated them with still greater dissoluteness till the Senate abolished them, 187 B.C.

**BACCHANTE** (bak-an'te). A person taking part in revels in honour of Bacchus. *See* BACCHANALIA.

**BACCHIGLIONE** (bâk-kil'yō-nā). A river of Northern Italy, rises in the Alps, passes through the towns of Vicenza and Padua, and enters the Adriatic near Chioggia, after a course of about 90 miles.

**BACCHUS** (bak'us; in Greek, generally *Dionȳsus*). The god of wine, son of Zeus (Jupiter) and Sĕmēlē. He first taught the cultivation of the vine and the preparation of wine. To spread the knowledge of his invention he travelled over various countries and received in every quarter divine honours. Drawn by lions (some say panthers, tigers, or lynxes), he began his march, which resembled a triumphal procession. Those who opposed him were severely punished, but on those who received him hospitably he bestowed rewards. His love was shared by several; but Ariadne, whom he found deserted upon Naxos, alone was elevated to the dignity of a wife, and became a sharer of his immortality.

In art he is represented with the round, soft, and graceful form of a maiden rather than with that of a young man. His long waving hair is knitted behind in a knot, and wreathed with sprigs of ivy and vine leaves. He is usually naked; sometimes he has a loose mantle hung negligently round his shoulders; sometimes a fawn-skin hangs across his breast. He is often accompanied by Silenus, Bacchantes, Satyrs, etc. *See* BACCHANALIA.—BIBLIOGRAPHY: Farnell, *Cults of the Greek States*; J. E. Harrison, *Prolegomena to the Study of Greek Religion*; Sir J. G. Frazer, *The Golden Bough*.

**BACCHYLIDES** (bak-kil'i-dēz). Born in the Island of Cos, about the middle of the fifth century B.C., the last of the great lyric poets of Greece, a nephew of Simonides and a contemporary of Pindar. The extant remains of his odes, hymns, pæans, etc., were augmented in 1897 by papyrus discoveries.

**BACCIOCCHI** (bât-chok'ē), **Maria Anne Eliza Bonaparte.** Sister of Napoleon, born at Ajaccio, 1777, died near Trieste, 1820; a great patroness of literature and art. She married Captain Bacciocchi, who in 1805 was created Prince of Lucca and Piombino. She virtually ruled these principalities herself, and as Grand-Duchess of Tuscany she enacted the part of a queen. She fell with the Empire.

**BACCIO DELLA PORTA** (bàch'ō). *See* BARTOLOMMEO.

**BACH** (bâh), **Johann Sebastian.** One of the Greatest of German musicians, born in 1685 at Eisenach, died in 1750 at Leipzig. Being the son of a musician he was early trained in the art, and soon distinguished himself. In 1703 he was engaged as a player at the Court of Weimar, and subsequently he was musical director to the Duke of Anhalt-Köthen, and afterwards held an appointment at Leipzig. He paid a visit to Potsdam on the invitation of Frederick the Great. As a player on the harpsichord and organ he had no equal among his contemporaries; but it was not till a century after his death that his greatness as a composer was fully recognized. His compositions, many of which are pieces of sacred music, show great originality. They include pieces, vocal and intrumental, for the organ, piano, stringed and keyed in-

Bach

struments; church cantatas, oratorios, masses, passion music, etc.

More than fifty musical performers have proceeded from this family. Sebastian himself had eleven sons, all distinguished as musicians. The most renowned were the following: Wilhelm Friedemann, born in 1710 at Weimar, died at Berlin in 1784. He was one of the most scientific harmonists and most skilful organists.—Karl Philipp Emmanuel, born in 1714 at Weimar, died in 1788 at Hamburg. He composed mostly for the piano, and published melodies for Gellert's hymns; he also wrote *The True Manner of Playing the Harpsichord*.—Johann Christoph Friedrich, born at Weimar, 1732, died in 1795, a great organist, is known also by the music he published.—Johann Christian, born in 1735 at Leipzig, died in London, 1782, was a favourite composer and conductor with the English public.—BIBLIOGRAPHY: P. Spitta, *Johann Sebastian Bach*; A. Pirro, *L'Esthétique de Jean Sebastian Bach*.

**BACHARACH** (bȧh'ȧ-rȧh). A small place of 200 inhabitants on the Rhine, 12 miles S. of Coblenz. The vicinity produces excellent wine, which was once highly esteemed. The view from the ruins of the castle is one of the sublimest on the Rhine.

**BACH'ELOR.** A term applied anciently to a person in the first or probationary stage of knighthood who had not yet raised his standard in the field. It also denotes a person who has taken the first degree in the liberal arts and sciences, or in divinity, law, or medicine, at a college or university; or a man of any age who has not been married.—A **knight bachelor** is one who has been raised to the dignity of a knight without being made a member of any of the orders of chivalry such as the Garter, the Thistle, or the Bath.

**BACHELOR'S BUTTONS.** The double-flowering buttercup (*Ranunculus acris*), with white or yellow blossoms, common in gardens.

**BACHIAN** (bȧch'ȧn). One of the Molucca Islands, immediately S. of the equator, S.W. of Gilolo; area, 800 sq. miles. It is ruled by a native sultan under the Dutch.

**BACHMUT** (bȧh-möt'). A town in the Ukraine, government of Ekaterinoslav, with a trade in cattle, tallow, etc., and coal and rock-salt mines. Pop. 20,000.

**BACILLA'RIA.** A genus of microscopic algæ, belonging to the class Diatomaceæ, the siliceous remains of which abound in cretaceous, tertiary, and more recent geological deposits.

**BACIL'LUS.** *See* BACTERIA.

**BACK, Admiral Sir George.** Eminent English Arctic discoverer, born 1796, died 1878. He accompanied Franklin and Richardson in their northern expeditions, and in 1833-4 headed an expedition to the Arctic Ocean through the Hudson Bay Company's territory, on which occasion he wintered at the Great Slave Lake, and discovered the Back or Great Fish River.

**BACKERGUNGE.** *See* BAKARGANJ.

**BACKGAM'MON.** A game played by two persons upon a table or board made for the purpose, with pieces or men, dice-boxes, and dice. The table is in two parts, on which are twenty-four black and white spaces called points. Each player has fifteen men of different colours for the purpose of distinction. The movements of the men are made in accordance with the numbers turned up by the dice.

**BACKHAUS, Wilhelm.** One of the greatest living pianists, born at Leipzig in 1884. At the age of twenty-one he was appointed a professor at The Royal College of Music, Manchester. This position, however, he soon gave up, and since 1905 has devoted his time to concert tours.

**BACKHUYSEN** (bȧk'hoi-zn), **Ludolf.** A painter of the Dutch school, particularly celebrated for sea pieces, born in 1631, died 1709. His most famous picture is a sea piece which the burgomasters of Amsterdam commissioned him to paint as a present to Louis XVI. It is still at Paris.

**BACKWARDA'TION.** A stock exchange term signifying the rate paid by a speculative seller of stock for the privilege of carrying over or continuing a bargain from one fortnightly account to another, instead of closing it on the appointed day.

**BACNINH.** A town of Tongking, on the Red River, fortified and containing a French garrison, being in an important strategic position. Pop. 7000.

**BACON.** Popular article of food. The flesh of the pig after it has been cured. Curing is a process of pickling and drying and sometimes smoking. In Great Britain the consumption of bacon and ham is about 600,000 tons a year. Bacon has a high food value. It is sold according to the brand (Wiltshire, for instance), the names referring to-day rather to the method of curing than to the place of production.

Great Britain imports much bacon from Ireland, Canada, Denmark and the United States, but a good deal is produced at home. Greater attention

is now paid to the required breed of pig, and bacon factories, on the Danish model, have been established. These are usually co-operative undertakings. In the United States and Denmark, all bacon must be passed by state officials before it can be sold. Bacon was not included in the articles on which an import duty was placed when Great Britain's fiscal policy was changed in 1931-32, but in April, 1932, a commission was set up to reorganise the marketing of bacon and other pig products.

**BA'CON, Anthony.** Elder brother of the celebrated Lord Chancellor, was born in 1558 and died in 1601. He was a skilful politician, and much devoted to learned pursuits. He became personally acquainted with most of the foreign literati of the day, and gained the friendship of Henri IV. of France. Francis Bacon dedicated to him the first edition of the *Essays*.

**BACON, Francis.** Baron Verulam, Viscount St. Albans, and Lord High Chancellor of England, was born at London in 1561, died at Highgate in 1626. His father, Nicholas Bacon, was Keeper of the Great Seal under Queen Elizabeth. He was educated at Trinity College, Cambridge, and in 1575 was admitted to Gray's Inn. From 1576 to 1579 he was at Paris with Sir Amyas Paulet, the English ambassador. The death of his father called him back to England, and being left in straitened circumstances he zealously pursued the study of law, and was admitted a barrister in 1582.

Bacon

In 1584 he became member of Parliament for Melcombe Regis, and soon after drew up a *Letter of Advice* to Queen Elizabeth, an able political memoir. In 1586 he was member for Taunton, in 1589 for Liverpool. A year or two after he gained the Earl of Essex as a friend and patron.

Bacon's talents and his connection with the Lord-Treasurer Burleigh, who had married his mother's sister, and his son, Sir Robert Cecil, First Secretary of State, seemed to promise him the highest promotion; but he had displeased the queen, and when he applied for the attorney-generalship, and next for the solicitor-generalship (1595), he was unsuccessful. Essex endeavoured to indemnify him by the donation of an estate in land. Bacon, however, forgot his obligations to his benefactor, and not only abandoned him as soon as he had fallen into disgrace, but without being obliged took part against him on his trial, in 1601, and was active in obtaining his conviction. He had been chosen member for the county of Middlesex in 1593, and for Southampton in 1597, and had long been a Queen's Counsel.

The reign of James I. was more favourable to his interest. He was assiduous in courting the king's favour, and James, who was ambitious of being considered a patron of letters, conferred upon him in 1603 the honour of knighthood. In 1604 he was appointed King's Counsel, with a pension of £60; in 1606 he married; in 1607 he became Solicitor-General, and six years after Attorney-General. Between James and his Parliament he was anxious to produce harmony, but his efforts were without avail, and his obsequiousness and servility gained him enmity and discredit. In 1617 he was made Lord-Keeper of the Seal; in 1618 Lord High Chancellor of England and Baron Verulam. In this year he lent his influence to bring a verdict of guilty against Raleigh. In 1621 he was made Viscount St. Albans.

Soon after this his reputation received a fatal blow. A new Parliament was formed in 1621, and the Lord Chancellor was accused before the House of bribery, corruption, and other malpractices. It is difficult to ascertain the full extent of his guilt; but he seems to have been unable to justify himself, and handed in a "confession and humble submission," throwing himself on the mercy of the Peers. He was condemned to pay a fine of £40,000, to be committed to the Tower during the pleasure of the king, declared incompetent to hold any office of State, and banished from Court for ever. The sentence,

however, was never carried out. The fine was remitted almost as soon as imposed, and he was imprisoned for only a few days. He survived his fall a few years, during this time occupying himself with his literary and scientific works, and vainly hoping for political employment.

In 1597 he published his celebrated *Essays*, which immediately became very popular, were successively enlarged and extended, and translated into Latin, French, and Italian. The treatise on the *Advancement of Learning* appeared in 1605; *The Wisdom of the Ancients* in 1609 (in Latin); his great philosophical work, the *Novum Organum* (in Latin), in 1620; and the *De Augmentis Scientiarum*, a much enlarged edition (in Latin) of the *Advancement*, in 1623. His *New Atlantis* was written about 1614-7; *Life of Henry VII.* about 1621. Various minor productions also proceeded from his pen. Numerous editions of his works have been published, by far the best being that of Messrs. Spedding, Ellis, and Heath, 1857-9 (reprinted, 1879-90).

Bacon was great as a moralist, a historian, a writer on politics, and a rhetorician, but it is as the father of the inductive method in science, as the powerful exponent of the principle that facts must be observed and collected before theorizing, that he occupies the grand position he holds among the world's great ones. His moral character, however, was not on a level with his intellectual, self-aggrandizement being the main aim of his life. We need do no more than allude to the preposterous attempt that has been made to prove that Bacon was the real author of the plays attributed to Shakespeare, an attempt that only ignorance of Bacon and Shakespeare could uphold and tolerate.—BIBLIOGRAPHY: J. Spedding, *Life and Letters of Francis Bacon*; R. W. Church, *Bacon* (in English Men of Letters Series); Sir Sidney Lee, *Great Englishmen of the Sixteenth Century*; J. M. Robertson, *Short History of Freethought*.

**BACON, John.** English sculptor, born 1740, died 1799. Among his chief works are two groups for the interior of the Royal Academy; the statue of Judge Blackstone for All Souls College, Oxford; another of Henry VI. for Eton College; the monument of Lord Chatham in Westminster Abbey; and the statues of Dr. Johnson and Mr. Howard in St. Paul's Cathedral.

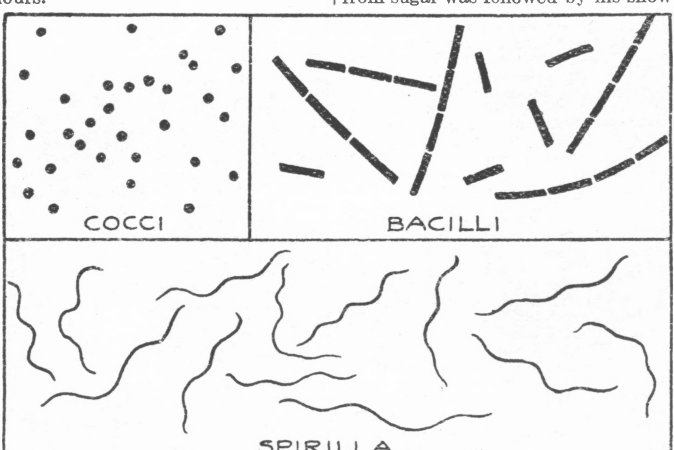
**BACON, Sir Nicholas.** Father of Francis Bacon, Lord-Keeper of the Great Seal, born 1510, died 1579. Henry VIII. gave him several lucrative offices, which he retained under Edward VI. He lived in retirement during the reign of Mary, but Queen Elizabeth appointed him Lord-Keeper for life. He was the intimate friend of Lord Burleigh, a sister of whose wife he married, and by her became the father of the great Chancellor.

**BACON, Roger.** An English monk, and one of the most profound and original thinkers of his day, was born about 1214, near Ilchester, Somersetshire, died at Oxford in 1294. He first entered the University of Oxford, and went afterwards to that of Paris, where he is said to have distinguished himself and received the degree of Doctor of Theology. About 1250 he returned to England, entered the order of Franciscans, and fixed his abode at Oxford; but having incurred the suspicion of his ecclesiastical superiors, he was sent to Paris and kept in confinement for ten years, without writing-materials, books, or instruments. The cause seems to have been simple enough. He had been a diligent student of the chemical, physical, and mathematical sciences, and had made discoveries, and deduced results, which appeared so extraordinary to the ignorant that they were believed to be works of magic. This opinion was countenanced by the jealousy and hatred of the monks of his fraternity. In subsequent times he was popularly classed among those who had been in league with Satan.

Having been set at liberty, he enjoyed a brief space of quiet while Clement IV. was Pope; but in 1278 he was again thrown into prison, where he remained for at least ten years. Of the close of his life little is known. His most important work is his *Opus Majus*, where he discusses the relation of philosophy to religion, and then treats of language, metaphysics, optics, and experimental science. He was undoubtedly the earliest philosophical experimentalist in Britain; he made signal advances in optics; was an excellent chemist; and in all probability discovered gunpowder. He was intimately acquainted with geography and astronomy, as appears by his discovery of the errors of the calendar, and their causes, and by his proposals for correcting them, in which he approached very near to truth.—Cf. E. Charles, *Roger Bacon, sa vie, ses ouvrages, ses doctrines*.

**BACTE'RIA** (Gr. *baktêrion*, a rod). A general term applied to the lowest visible forms of life; other names given are *germs* or *microbes*. They are divided into three classes: (1) *cocci*—

these are minute spheres about one twenty-five thousandth of an inch in diameter, arranged in chains or clusters; (2) *bacilli*—these are straight rods about the breadth of a coccus and two to four times as long; (3) *spirilla*—here there are two forms: one is like a bacillus, but curved (spirillum proper or vibrio); the other is a very fine spiral thread (spirochaete) often only half the thickness of a vibrio and two to six times as long. Bacteria consist of protoplasm surrounded by a membrane, and many show active movements; they all multiply asexually by splitting, and so rapidly may the process occur that 17,000,000 organisms or more may be formed from one bacterium in twenty-four hours.




The Simpler Forms of Bacteria, showing the three types of lower bacteria—the globular or spherical "cocci," the rod-like "bacilli" and the spiral or curved "spirilla."

The chief part played by bacteria in nature is to cause putrefaction. They are found on all organic matter, and are therefore omnipresent. When grown artificially (*see* BACTERIOLOGY) they usually require organic matter for their food, and this they split up into simpler chemical compounds, some of which are very poisonous to animals (toxins); they can also split up sugars to produce various alcohols, acids, and gases. When certain of the bacilli are starved, the living matter gathers itself up into a spore surrounded by a very resisting membrane, and it can survive for a long time in this condition. All ordinary bacteria, including most of those which produce disease, can be killed by a few minutes' boiling, but the sporing varieties (e.g. many putrefactive forms) withstand much longer boiling—up to one and a half hours; they can also be killed by chemical means (*see* DISINFECTION). Many bacteria are useful to man, and a few give rise to disease (*see* GERM THEORY).

**BACTERIOLOGY.** The branch of science which deals with the structure and properties of bacteria. Though the existence of bacteria had been known from the time when Leeuwenhock arranged lenses so as to form a microscope, it was through the work of Pasteur that modern knowledge regarding the group originated. Pasteur's discovery that yeasts are the cause of the formation of alcohol from sugar was followed by his showing that bacteria are responsible for other processes of a similar character, e.g. the formation of vinegar from alcohol, the occurrence of the rancid change in butter, etc. When he went on to prove that a bacterium was the cause of a disease of silkworms, a stimulus was given to the germ theory of infection, and bacteriology was thus early brought intimately into contact with medical science.

Another stimulus to bacteriological inquiry came from the controversy on spontaneous generation, and Pasteur was one of those who helped to establish the principle that the new development of living things, as represented by bacteria, out of non-living matter does not take place. This led to the inevitable deduction

that all putrefactive processes are due to bacteria. On this Lister founded his antiseptic treatment of wounds, the practical effects of which focused attention on the important part played by bacteria in human affairs.

The modern science of bacteriology really dates from 1877, when Koch proved that the *Bacillus anthracis* is the cause of anthrax in cattle. The outstanding feature of Koch's research was that in it, for the first time, methods were employed whereby all extraneous organisms were excluded from the inquiry, and the way was thus opened up for the study of the properties and effects of one species of bacterium acting by itself. The chief aspects of his work were as follows : (1) the determination of the temperatures at which bacteria are killed ; the knowledge of this enables investigators to render free from living organisms their apparatus and the food materials (usually called *media*) necessary to support bacterial life (this is called *sterilization*) ; (2) the discovery that the insertion of a plug of cotton-wool in the neck of a vessel (e.g. a flask or test-tube) before its sterilization constitutes a sufficient filter, which prevents bacteria in the outside air gaining access to its interior or to any food medium placed in it for sterilization ; (3) the elaboration of a series of media capable of acting as food for all the commonly occurring bacteria ; (4) the introduction of a simple method of separating from one another bacterial species which in nature are often growing side by side. This is effected by making media containing a jelly (e.g. gelatine) which melts at a relatively low temperature. The bacterial mixture is well diluted in the melted medium, and this is poured out in a thin layer on a sterile glass plate and allowed to set. Each individual bacterial cell can thus multiply apart from neighbouring cells, and, it may be, in a few hours the resulting growth (a " colony ") is visible to the naked eye. A minute part of the colony is picked off with a heated needle and placed on a mass of sterile medium. In this way a " pure culture " of each species present in the original mixture can be obtained. Koch's work was chiefly concerned with disease bacteria, and between 1880 and 1895 many such organisms were isolated in pure culture and their properties investigated (*see* GERM THEORY OF DISEASE).

While in the evolution of knowledge the progress of bacteriology has been most associated with that of medicine and surgery, the science has fundamental relations with many other human interests, and the same methods are used in investigating such relationships. The adaptation of these methods on a commercial scale underlies all industrial processes concerned in the preserving of milk and in the canning and bottling of meat and fruit (apart from the addition of chemical preservatives).

Since bacteriology came into existence, many of the most primitive domestic procedures have been improved and placed on a scientific basis. Thus, butter-making involves a previous souring of the milk ; this is due to bacterial action, and standard mixtures of milk-souring bacteria are now regularly supplied by the laboratory as " starters " of the process. It is recognised that the disorders of milk, e.g. " ropiness," " blue milk," etc., are due to certain " wild " bacteria gaining access to the dairy. The ripening of such cheeses as Gorgonzola and Silton is due to bacteria and allied organisms, and here again light has been shed on the " diseases " of cheese by bacteriological investigation. The pickling of foods by salt, or vinegar, or nitre, is due to the action of these substances as antiseptics, and a similar principle, aided by boiling, underlies the making of jams. Again, certain kinds of bacteria which only flourish at high temperatures are responsible for the heating of hay and corn stacks, and for the production of ensilage.

Bacteriology is also throwing important light on factors concerned in the fertility of soils. For example, it has been shown that the little nodules on the roots of plants of the pea tribe are caused by bacteria ; these, in growing, take up nitrogen from the air, and form compounds which promote the growth of the plant on which they are parasites and remain to enrich the soil when the plant dies. In short, there is no industry, which depends on natural putrefaction being prevented or modified so as to stop at a particular stage, which bacteriology cannot guide towards securing the most perfect results.—BIBLIOGRAPHY: Fischer, *The Structure and Functions of Bacteria* ; Abbot, *Principles of Bacteriology* ; Muir and Ritchie, *Manual of Bacteriology* ; E. R. Stitt, *Practical Bacteriology* ; P. H. Hiss and H. Zinsser, *A Textbook of Bacteriology*.

**BACTRIA'NA,** or **BACTRIA.** A country of ancient Asia, south of the Oxus and reaching to the west of the Hindu Kush. It is often regarded as the original home of the Indo-European races. A Græco-Bactrian kingdom flourished about the third century B.C., but its history is obscure.

**BACULI'TES.** A fossil genus allied to the ammonites, characteristic of cretaceous strata, having a straight tapering shell. *See* CEPHALOPODA.

**BA'CUP.** A municipal borough of England, in Lancashire, 18 miles N. of Manchester. The chief manufacturing establishments are connected with cotton-spinning and power-loom weaving; there are also ironworks, turkey-red dyeing works, and in the neighbourhood numerous coal pits and immense stone quarries. Pop. (1931), 20,606.

**BADAGRY.** A seaport in the British province of Southern Nigeria, West Africa, 50 miles E.N.E. of Whydah. Pop. about 10,000.

**BADAJOZ** (bȧ-*dȧ-hŏth'*; ancient, **PAX AUGUSTA**). The fortified capital of the Spanish province of Badajoz, on the left bank of the Guadiana, which is crossed by a stone bridge of twenty-eight arches. It is a bishop's see, and has an interesting cathedral. During the Peninsular War Badajoz was besieged by Marshall Soult, and taken in March, 1811. It was twice attacked by the English, on 5th and 29th May, 1811, and was besieged by Wellington on the 16th March, and taken 6th April, 1812. Pop. 38,612.—The province of Badajoz has an area of 8451 sq. miles. Pop. 656,654.

**BADAKSHAN'.** A territory of Central Asia, which is tributary to Afghanistan. It has the Oxus on the north, and the Hindu Kush on the south, and has lofty mountains and fertile valleys; the chief town is Faizabad. The inhabitants profess Mahommedanism. Pop. 20,957.

**BADALONA** (bă-*dȧ-lō'na*). A Mediterranean seaport of Spain, 5 miles from Barcelona. Pop. 28,000.

**BADEN** (bä'*dĕn*). Formerly a Grand-Duchy and one of the more important States of the German Empire, situated in the S.W. of Germany, to the west of Württemberg. It is divided into four districts, Constance, Freiburg, Karlsruhe, and Mannheim. It has an area of 5819 sq. miles, and a pop. of 2,142,833. It is mountainous, being traversed to a considerable extent by the lofty plateau of the Schwarzwald or Black Forest, which attains its highest point in the Feldberg (4904 feet). The nucleus of this plateau consists of gneiss and granite. In the north it sinks down towards the Odenwald, which is, however, of different geological structure, being composed for the most part of red sandstone. The whole of Baden, except a small portion in the S.E., in which the Danube takes its rise, belongs to the basin of the Rhine, which bounds it on the south and west. Numerous tributaries of the Rhine intersect it, the chief being the Neckar. Lakes are numerous and include a considerable part of the Lake of Constance. The climate varies much. The hilly parts, especially in the east, are cold and have a long winter, while the valley of the Rhine enjoys the finest climate of Germany.

The principal minerals worked are coal, salt, iron, zinc, and nickel. The number of mineral springs is remarkably great, and of these not a few are of great celebrity. The vegetation is peculiarly rich, and there are magnificent forests. The cereals comprise wheat, oats, barley, and rye. Potatoes, hemp, tobacco, wine, and sugar-beet are largely produced. Several of the wines, both white and red, rank in the first class. Baden has long been famous for its fruits also. Of the total area 55.4 per cent is under cultivation, 39.4 per cent under forest, and 5.2 per cent uncultivated (houses, roads, water, etc.). The farms are mostly quite small. The manufactures are important. Among them are textiles, tobacco and cigars, chemicals, machinery, pottery ware, jewellery (especially at Pforzheim), wooden clocks, confined chiefly to the districts of the Black Forest, musical boxes and other musical toys. The capital is Karlsruhe, about 5 miles from the Rhine; the other chief towns are Mannheim, Freiburg-im-Breisgau (with a Roman Catholic university), Baden, and Heidelberg. Baden has warm mineral springs, which were known and used in the time of the Romans. Heidelberg has a university (Protestant), founded in 1386, the oldest in Germany. The railways have a length of 1200 miles, and are all State property.

In the time of the Roman Empire southern Baden belonged to the Roman province of Rhætia. Under the old German Empire it was a margravate, which in 1533 was divided into Baden-Baden and Baden-Durlach, but reunited in 1771. The title of grand-duke was conferred by Napoleon in 1806, and in the same year Baden was extended to its present limits. Until 1918 the executive power was vested in the grand-duke, the legislative in a house of legislature, consisting of an upper and a lower chamber. The former consisted partly of hereditary members; the latter of elected representatives of the people. In the break-up of the German Empire in Nov., 1918, Baden was among the first States to feel the shock of revolution. The Grand-Duke Frederick I. abdicated. According to the Constitution passed in 1919, the Free State of Baden is a

republic and a component state of Germany. Two-thirds of the population are Roman Catholics, the rest Protestants.

**BADEN** (or **BADEN-BADEN**, to distinguish it from other towns of the same name; German *Bad*, a bath). A town and watering-place, in the former Grand-Duchy of Baden, 18 miles S.S.W. of Karlsruhe, built in the form of an amphitheatre on a spur of the Black Forest, overhanging a valley, through which runs a little stream Oosbach. Baden has been celebrated from the remotest antiquity for its thermal baths; and it used also to be celebrated for its gaming saloons. It has many good buildings, and a castle, the summer residence of the former grand-dukes. Pop. 25,004.

**BADEN.** A town of Austria, 15 miles S.W. of Vienna. It has numerous hot sulphureous springs, used both for bathing and drinking, and much frequented. Pop. 21,000.

**BADEN.** A small town of Switzerland, canton Aargau, celebrated for its hot sulphureous baths, which attract many visitors. Pop. 8318.

**BADENOCH.** Name of a district about 40 m. long in the S.E. of Inverness-shire, Scotland. It may be described as the Valley of the Spey. A mountainous area, it is mainly deer forest, and contains Loch Ericht. A son of King Robert II. was called the Wolf of Badenoch and ruled this district. Later it became the property of the Marquess of Huntly, who bears the title of Lord of Badenoch.

**BADEN-POWELL.** *See* POWELL.

**BADGE** (baj). A distinctive device, emblem, mark, honorary decoration, or special cognizance, used originally to identify a knight or distinguish his followers, now worn as a sign of office or licensed employment, as a token of membership in some society, or generally as a mark showing the relation of the wearer to any person, occupation, or order. *See* COCKADE, HERALDRY, TOTEMISM.

**BADGER** (baj'ẽr). A plantigrade, carnivorous mammal, allied both to the bears and to the weasels, of a clumsy make, with short thick legs, and long claws on the forefeet. The common badger (*Meles vulgāris*) is as large as a middling-sized dog, but much lower on the legs, with a flatter and broader body, very thick tough hide, and long coarse hair. It inhabits the north of Europe and Asia, burrows, is indolent and sleepy, feeds by night on vegetables, small quadrupeds, etc. Its flesh may be eaten, and its hair is used for artists' brushes in painting. The American badger belongs to a separate genus.

Common Badger (*Meles vulgāris*)

*Badger baiting*, or *drawing the badger*, is a barbarous sport, long a favourite amusement in England, but declared illegal in the middle of last century, and yet to some extent practised, generally as an attraction to public-houses of the lowest sort. A badger is put in a barrel, and one or more dogs are put in to drag him out. When this is effected he is returned to his barrel, to be similarly assailed by a fresh set. The badger usually makes a most determined and savage resistance.

**BADGER DOG.** A long-bodied, short-legged dog, with large pendulous ears, usually short haired, black, and with yellow extremities; often called by its German name *Dachshund*.

**BAD'MINTON.** A game closely resembling lawn-tennis, but played with battledore and shuttle-cock instead of ball and racket: named after a seat of the Duke of Beaufort, in Gloucestershire.

**BADRINATH** (-ät'). A peak of the main Himalayan range, in Garhawál District, in the United Provinces, 23,210 feet above the sea. On one of its shoulders, at an elevation of 10,400 feet, stands a celebrated temple of Vishnu, which some years attracts as many as 50,000 pilgrims.

**BAEDEKER** (bā'de-kẽr), **Karl.** A German publisher, born 1801, died 1859; originator of a celebrated series of guide-books for travellers. His business is carried on by his descendants at Leipzig.

**BAEL.** A plant akin to the orange. It grows in India and its fruit is used as a cure for dysentery. Perfume and dye are obtained from the rind, and the seeds are used for making cement. It is imported into England in dried slices.

**BAELZ'S DISEASE.** An affection of the mouth characterized by swelling of the mucous glands of the mouth and lips, leading to the

formation of small abscesses and ulcers.

**BAENA** (bà-ā′nà). A town of Spain, in Andalusia, province of Cordova, and 24 miles S.S.E. of the city of that name. Pop. 14,730.

**BAEZA** (bà-ā′thà; anciently, **BEATIA**). A town of Spain, in Andalusia, 22 miles E.N.E. of Jaen, with 15,843 inhabitants. The principal edifices are the cathedral, the university (now suppressed), and the old monastery of St. Philip de Neri.

**BAFFA** (ancient, **PAPHOS**). A seaport on the S.W. coast of Cyprus. Pop. 1000. It occupies the site of New Paphos, which, under the Romans, was full of beautiful temples and other public buildings. Old Paphos stood a little to the south-east.

**BAFFIN, William.** An English navigator, born 1584, famous for his discoveries in the Artic regions; in 1616 he ascertained the limits of Baffin Bay. He was killed at the siege of Ormuz, in the East Indies, 1622.

**BAFFIN BAY.** On the N.E. of North America, between Greenland and Baffin Land and other islands that lie on the N. of the continent; discovered by Baffin in 1616.

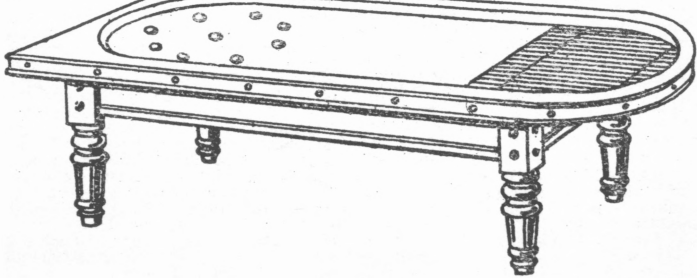
**BAFULABE** (bà-fu-lä-bā). A trading-place in French West Africa, on the Upper Senegal, and on the railway that runs from Kayes on the Senegal to Bammako on the Niger.

**BAGAMO′YO.** A seaport in Tanganyika, opposite Zanzibar and north-west of Dar-es-Salaam. There is no proper harbour, only a shallow and rather exposed roadstead where ships have to anchor some distance from the shore, yet it is the chief trading-centre of the colony, and as the terminus of the caravan route to Tanganyika is a place of some importance. Pop. about 25,000. *See* EUROPEAN WAR.

**BAGASSE′**, the sugar-cane in its dry crushed state as delivered from the mill, and after the main portion of its juice has been expressed; used as fuel in the sugar factory, and called also *cane-trash*.

**BAGATELLE′**. A game played on a long flat board covered with cloth like a billiard-table, with spherical balls and a cue or mace. At the end of the board are nine cups or sockets of just sufficient size to receive the balls. These sockets are arranged in the form of a regular octagon, with the ninth in the middle, and are numbered consecutively from one upwards. Nine balls are used, generally one black, four white, and four red, the distinction between white and red being made only for the sake of variety. In the ordinary game, at starting, the black ball is placed on a point in the longitudinal middle line of the board, a few inches in front of the nearest of the sockets, and the player places one of his eight balls on a corresponding point at the other end of the board, and tries to strike the black ball into one of the sockets with his own. After this his object is to place as many of his balls as possible in the sockets. Each ball so placed counts as many as the socket is numbered for, and the black ball always counts double. He who first makes the number of points agreed on wins.

**BAGEHOT** (bag′ot), **Walter.** English economist and journalist, born at Langport, Somerset, 1826, died at the same place 1877. He studied at Bristol, and at University College, London, and graduated as B.A. and M.A. at the London University (1848). He was for some time associated with his father in the banking business at Langport, and for a number of years he acted as London agent for the bank. He was one of the editors of the *National Review* (1855-64), and from



Bagatelle

1860 till his death he was editor and part proprietor of the *Economist*. His chief works are: *Physics and Politics*; *The English Constitution*; *Lombard Street*; and *Studies, Literary, Biographic, and Economic*. He was a high authority on economics, banking, and finance, and was often consulted by public men.

**BAG'GALA.** A two-masted Arab boat, generally 200-250 tons burden, used for trading in the Indian Ocean, Red Sea, etc.

Baggala

**BAGGESEN** (bág'e-sen), **Jens.** A Danish poet, who also wrote much in German, born 1764, at Korsör, died at Hamburg, 1826. He led a rather wandering and unsettled life, spending some time in England as well as in France and Germany. He tried lyric, epic, and dramatic poetry, but was most successful as a humorist and satirist. One of his best poems is his famous song *There was a Time when I was very Little.*

**BAGGING.** Is the name of the textile material which is used in the making of bags. Baltic hemp was the first material used for the purpose, but now all kinds of fibres are used, though the majority of bags are made of jute fibre. The style of the bagging used depends, naturally, upon the requirements of the bag; for the export of raw cotton from the United States of America we find the coarsest of all cotton-bagging used. When intended to carry grain, spices, sugar, etc., the bag must be made of closely-woven material. In many cases bags to carry sugar are lined with paper.

**BAGHDAD', or BAGDAD.** A city of a vilayet of same name (54,540 sq. miles; pop. 1,360,304) now the capital of 'Iraq. The greater part of it lies on the eastern bank of the Tigris, which is crossed by a bridge of boats; old Baghdad, the residence of the caliphs (now in ruins), was on the western bank of the river. The city occupies a large area. The houses are mostly built of brick, the streets unpaved and very narrow, and there are few buildings of any note. The palace of the governor is spacious. Of the mosques only a few attract notice, many are in ruins; the bazaars are large and well stocked; that of Dawd Pasha still ranks as one of the most splendid in the world.

**Manufactures.** Leather, silks, cottons, woollens, carpets, etc. Steamers ply on the river between Baghdad and Basra, and the town exports wheat, dates, galls, gums, mohair, carpets, etc., to Europe, the chief import being cotton goods. The estimated population is over 250,000; of these about 90,000 are Mahommedans, 55,000 Jews, and 7000 Christians. The city has been frequently visited by the plague. Baghdad was founded in 762 by the Caliph Almansur, and raised to a high degree of splendour in the ninth century by Harun Al Rashid. It is the scene of a number of the tales of the *Arabian Nights*. It was long the chief city of the Mahommedan world, and at one time is said to have had two millions of inhabitants. In the thirteenth century it was stormed by Hulaku, grandson of Genghis-Khan, who caused the reigning caliph to be slain, and destroyed the caliphate. It was again laid waste by Timur in 1401. For a considerable period it was the object of contention between the Persians and the Turks, until it was besieged and captured by Sultan Murad IV. in 1638. Since that date it remained a part of the Turkish Empire. It was captured by the British on 11th March, 1917.

**BAGHDAD RAILWAY.** A railway starting at Konia, in Asia Minor, the eastern terminus of the Anatolian Railway from Haidar Pasha on the Bosporus, and intended to run to Baghdad and Koweit on the Persian Gulf (a distance of 1550 miles). Construction commenced in 1899 and 1200 miles had been completed by 1914. This was increased during the European War, but subsequently fell to about 1100 owing to the lifting of some unimportant sections. German capital was used throughout, and the line was part of the Berlin-Balkan-Baghdad scheme which was to provide Germany with a safe means of transport to India. The British completed the Basra-Baghdad section in 1920. The railway now runs from Konia to Adana and Aleppo (where it connects with the Pilgrims' line from Medina and Damascus), then to Jerablus, where it crosses the Euphrates, and on to Nisibin. There is a blank between Nisibin and Sharqat, but the

line thereafter runs to Baghdad, An Nasiriya, and Basra.

**BAGHELKAND.** A tract of country in Central India, occupied by a collection of native States (Rewah being the chief), under the Governor-General's agent for Central India; area, 14,706 sq. miles. Pop. 1,772,574.

**BAGHERIA** (bá-gā'rē-á). A town of Sicily, province of Palermo, 9 miles by railway from the city of Palermo. Pop. 21,212.

**BAGIMONT'S ROLL.** A rent-roll of Scotland made up in 1275 by *Baiamund* or *Boiamond* de Vicci, vulgarly called *Bagimont*, who was sent from Rome by the Pope, in the reign of Alexander III., to collect the tithe of all the church livings in Scotland for an expedition to the Holy Land. It remained the statutory valuation, according to which the benefices were taxed, till the Reformation. A copy of it as it existed in the reign of James V. is in the Advocates' Library, Edinburgh.

**BAGIRMI** (bá-gir'mē), or **BAGHERMI.** A Mohammedan Negro State in Central Africa, situated to the south-east of Lake Tchad. It is mostly a plain; has an area of about 20,000 sq. miles, and about 150,000 inhabitants. The people are industrious and fairly civilized. The country is in the French sphere of influence, but the people are still under a native ruler acting on French advice.

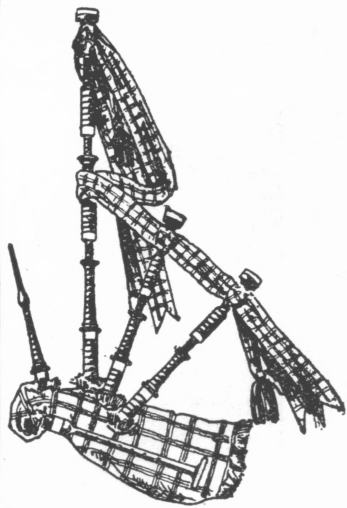
**BAGNARA** (bá-nyä'rá). A seaport near the S.W. extremity of Italy. Pop. 11,000.

**BAGNÈRES DE BIGORRE** (bán-yār dė bē-gorr). A watering-place, France, department Hautes-Pyrénées, on the left bank of the Adour. It owes its chief celebrity to its sulphurous and saline baths. The springs were known to and used by the Romans. The site is one of the most romantic in the Pyrénées, and the town is well built and well provided with accommodation for visitors. Pop. 8455.

**BAGNÈRES DE LUCHON** (bán-yār dė lu-shōn). A town, France, department Haute-Garonne, in a picturesque valley surrounded by wooded hills, one of the principal watering-places of the Pyrénées, having sulphurous thermal waters, beneficial in rheumatic complaints. There is a large bathing establishment, and a large and splendid casino building, comprising a theatre, concert and ball-rooms, etc. Resident pop. 4000.

**BAGNI** (bā'yē). Italian for "baths," a name in Italy for various places which possess natural baths or thermal springs, with some designation added to mark the particular locality. **Bagni di Lucca,** in the province of Lucca, and about 13 miles north-east of the city of Lucca, is one of the most frequented of these bathing-places, its waters being recommended against gout, rheumatism, affections of the skin, etc.

**BAGPIPE.** A musical wind-instrument of very great antiquity, having been used among the ancient Greeks, and being a favourite instrument over



Bagpipes

Europe generally in the fifteenth century. It still continues in use among the country people of Poland, Italy, the south of France, and in Scotland and Ireland. Though now often regarded as the national instrument of Scotland, especially Celtic Scotland, it is only Scottish by adoption, being introduced into that country from England. It consists of a leathern bag, which receives the air from the mouth, or from bellows; and of pipes, into which the air is pressed from the bag by the performer's elbow. In the common or Highland form, one pipe (called the *chanter*) plays the melody; of the three others (called *drones*) two are in unison with the lowest *A* of the chanter, and the third and longest an octave lower, the sound being produced by means of reeds. The chanter has eight holes, which the performer stops and opens at pleasure, but the scale is imperfect and the tone harsh.

The Highland bagpipe is a powerful instrument, and calls for great exertion of the lungs in order that the air may be supplied in sufficient quantity. There are several other species of bagpipes, as the soft and melodious Irish bagpipe, supplied with wind by a bellows, and having several keyed drones and a keyed chanter; the old English bagpipe (now no longer used); the Italian bagpipe, a very rude instrument, etc. The Irish bagpipe is, musically speaking, the most perfect of all.—BIBLIOGRAPHY: Sir J. G. Dalyell, *Musical Memories of Scotland*; E. de Bricqueville, *Les Musettes*.

**BAGRATION** (bág-rä'tyŏn), **Peter, Prince.** Distinguished Russian general, descended from a noble Georgian family. He was born in 1765, entered the Russian army in 1782, and henceforth was constantly engaged in active service, distinguishing himself in many actions and gradually rising in military rank. He fought in Poland, in Italy, and against the Turks, was engaged in the battles of Austerlitz, Eylau, and Friedland, and at last was mortally wounded at the battle of Borodino, Sept., 1812.

**BAGSHOT-SAND.** In geology, the collective name for a series of sands of the Eocene age, occupying extensive tracts round Bagshot, in Surrey, and in the New Forest, Hampshire, the whole reposing on the London clay; generally devoid of fossils.

**BAGSTER, Samuel.** Publisher, founder of the firm of Bagster & Sons, celebrated for their bibles, was born in 1722, and died in 1851. He began business as a London bookseller in 1794, and soon turned his attention to the publication of bibles, bringing out a Hebrew bible, the *Septuagint* (Greek) version, and the English version, with 60,000 parallel references, followed by his great polyglot bible, which in its final form showed eight languages at the opening of the volume. Separate versions in different languages were also brought out, with various other aids to the study of Scripture; a polyglot *Book of Common Prayer*, in eight languages, etc.

The Bahamas

The group contains about 3000 islands, all composed of coral. They rise only a few feet above sea level

**BAHA'DUR SHAH.** The last of the Grand Moguls of India, a descendant of Tamerlane. In 1857, during the Indian Mutiny, the Mahommedans, who wished to restore the Empire of the Moguls, placed him, then a very old man, at the head of the movement in Delhi; but the city was soon retaken by the British, and the Emperor was banished to Rangoon, where he died in 1862.

**BAHA'MA ISLANDS,** or **LUCAYOS.** A group of islands in the West Indies, forming a colony belonging to Britain, lying N.E. of Cuba and S.E. of the coast of Florida, the Gulf Stream passing between them and the mainland. They extend a distance of upwards of 600 miles, and are said to be twenty-nine in number, besides keys and rocks innumerable. The

principal islands are Grand Bahama, Great and Little Abaco, Andros Islands, New Providence, Eleuthera, San Salvador, Great Exuma, Watling Island, Long Island, Crooked Island, Acklin Island, Mariguana Island, Grand Inagua. Of the whole group about twenty are inhabited, the most populous being New Providence, which contains the capital, Nassau; the largest being Andros, 100 miles long, 20 to 40 broad. They are low and flat, and have in many parts extensive forests. Total area, 4400 sq. miles.

**Exports.** The soil is a thin but rich vegetable mould, and an important product is pineapples, which form a large export (both canned and green). Other fruits are also grown, with sisal hemp (a valuable export), cotton, sugar, maize, yams, ground nuts, coconuts, etc. Sponges are obtained in large quantity, and are at present the chief export. Total exports about £406,275 (1926). The Bahama Islands are a very favourite winter resort for persons suffering from lung trouble. San Salvador, or Cat Island, is generally believed to be the same as Guanahani, the land first touched on by Columbus (12th Oct., 1492) on his first great voyage. The first British settlement was made on New Providence towards the close of the seventeenth century. A number of loyal Americans settled in the islands after the War of Independence. Pop. 56,924, including 14,000 whites.

**BAHA'WALPUR.** A town of India, capital of State of same name in the Punjab, 2 miles from the Sutlej; surrounded by a mud wall and containing the extensive palace of the Nawab. Pop. 18,700. The State has an area of 15,000 sq. miles, of which 10,000 is desert, the only cultivated lands lying along the Indus and Sutlej. Pop. 781,191.

**BAHIA** (bä-ē'ä; formerly **ST. SALVADOR**). A town of Brazil, on the Bay of All Saints, State of Bahia. It consists of a lower town, which is little more than an irregular, narrow, and dirty street, stretching about 4 miles along the shore; and an upper town, larger and much better built, with various outlying suburbs. The harbour is one of the best in South America; and the export trade, chiefly in sugar, cotton, coffee, tobacco, hides, piassava, and tapioca, is very extensive. Pop. 350,000. The State, area 164,600 sq. miles, pop. 3,334,465, has much fertile land, both along the coast and in the interior.

**BAHIA BLANCA.** A seaport of the Argentine Republic, on a bay of same name opening into the Atlantic, about 350 miles south-west of Buenos Ayres; it is a rising place connected by railway with the capital, and a terminus of other railways from the interior. It carries on a considerable trade directly with Europe, exporting mutton, wheat, etc. Pop. 44,143.

**BAHR** (bär). An Arabic word signifying sea or large river; as in Bahr-el-Huleh, the Lake Merom in Palestine; Bahr-el-Abiad, the White Nile, Bahr-el-Azrek, the Blue Nile, which together unite at Khartoum.

**BAHRAICH** (bä-rāch'). A flourishing town of India, in Oudh, Faizabad division. It carries on a good local trade, and has a shrine that attracts many Hindu and Mohammedan pilgrims. It is the seat of an American Methodist mission. Pop. 27,304.

**BAHREIN** (bä'rīn) **ISLANDS.** A group of islands in the Persian Gulf, in an indentation on the Arabian coast, since 1867 under British protection. The principal island, usually called Bahrein, is about 27 miles in length and 10 in breadth. It is in general very flat and low, and the soil is not very fertile except in a few places; but irrigation is employed and excellent dates are grown. The principal town is Menamah or Manama; pop. 35,000. The smaller island of Moharrek, separated by a shallow strait 2 miles wide, contains the town of Moharrek, the present seat of government; pop. 25,000. The Bahrein Islands are chiefly noted for their pearl-fisheries, which were known to the ancients, and which employ in the season from 2000 to 3000 boats manned by from 8 to 20 men each. Total pop. 110,000; total area, 250 sq. miles.

**BAHR EL GHAZAL.** A large river of Central Africa, a western tributary of the White Nile (or Bahr-el-Abiad). It flows through a very swampy region, and is liable to inundations. The head of steam navigation is Meshra-er-Rek. The river gives its name to a province of the Anglo-Egyptian Sudan, yielding ivory, rubber, timber, etc., and suited for cotton growing.

**BAIADEER.** *See* BAYADERE.

**BAIÆ** (bī'ē). An ancient Roman watering-place on the coast of Campania, 10 miles west of Naples. Many of the wealthy Romans had country houses at Baiæ, which was a favourite resort of Horace. Ruins of temples, baths, and villas still attract the attention of archæologists.

**BAIKAL** (bī'kál). A large freshwater lake in Eastern Siberia, 360 miles long, and about 50 in extreme breadth, interspersed with islands; in the line of the great Siberian

Railway. It is surrounded by rugged and lofty mountains; contains seals, and many fish, particularly salmon, sturgeon, and pike. Its greatest depth is over 4000 feet. It receives the waters of the Upper Angara, Selenga, Barguzin, etc., and discharges its waters by the Lower Angara. It is frozen over in winter.

**BAIKIE, William Balfour.** Born in the Orkney Islands 1824, died at Sierra Leone 1863. He joined the British navy, and was made surgeon and naturalist of the Niger Expedition, 1854. He took the command on the death of the senior officer, and explored the Niger for 250 miles. Another expedition, which started in 1857, passed two years in exploring, when the vessel was wrecked, and all the members, with the exception of Baikie, returned to England. With none but native assistance he formed a settlement at the confluence of the Benué and the Quorra, in which he was ruler, teacher, and physician, and within a few years he opened the Niger to navigation, made roads, and established a market.

**BAIL.** The person or persons who procure the release of a prisoner from custody by becoming surety for his appearance in court at the proper time; also, the security given for the release of a prisoner from custody. In the United States bail is a matter of right in all cases where a sentence of death cannot be pronounced, and even in such a case it may be allowed by one of the judges.

**BAILDON.** An urban district in the W. Riding of Yorkshire, about 5 miles north of Bradford, with worsted manufactures, chemical works, and quarries. Pop. (1931), 7794.

**BAILEN** (bī-len'). A town of Southern Spain, province Jaen, with lead mines. Pop. 8334.

**BAILEY** (bā'li). The name given to the courts of a castle formed by the spaces between the circuits of walls or defences which surrounded the keep.

**BAILEY, or BAILY, Nathaniel.** An English lexicographer, school teacher at Stepney and author of several educational works. His *Dictionary*, published in 1721, pa sed through a great many editions.

**BAILEY, Philip James.** English poet, born near Nottingham, 1816, called to the bar 1840, died 1902. He published *Festus*, his best work, in 1839; *The Mystic*, 1855; *The Age*, 1858; and *The Universal Hymn*, 1867.

**BAILIE, or BAILLIE.** A magistrate in Scotland, elected by the town councillors of a burgh from their own number, corresponding to an *alderman* in England. The criminal jurisdiction of the provost and bailies of a burgh extends to breaches of the peace, thefts not of an aggravated character, and other offences not of a serious nature. As a term in conveyancing *bailie* is not now used.

**BAILIFF.** A civil officer or functionary, subordinate to some one else. There are several kinds of bailiffs, whose offices widely differ, but all agree in this, that the keeping or protection of something belongs to them. In England the sheriff is the monarch's bailiff, and his county is a bailiwick. The name is also applied to the chief magistrates of some towns, to keepers of royal castles, as of Dover, to persons having the conservation of the peace in hundreds and in some special jurisdictions, as Westminster, and to the returning officers in the same. But the officials commonly designated by this name are the *bailiffs* of sheriffs, or sheriffs' officers, who execute processes, etc.

**BAILLEUL** (bâ-yeul). An ancient French town, department of Nord, near the Belgian frontier, about 19 miles west of Lille. Much fighting took place in its vicinity during the European War, but it was not destroyed until the campaign of 1918. Pop. 12,828.—A village of the same name in department Orne gave its name to the Baliol family.

**BAILLIE, Lady Grizel.** A Scottish poetess and heroine, born in 1665. She was a daughter of the Earl of Marchmont, and helped him—a Covenanter—to escape from his enemies, and later went with him to Holland. She returned to Scotland and married George Baillie of Jerviswood. Her poems are still remembered. She died in 1746.

**BAILLIE, Joanna.** A Scottish authoress, born at Bothwell, Lanarkshire, in 1762, died at Hampstead, 1851. She removed in early life to London, where her brother, Matthew Baillie, was settled as a physician. Here in 1798 she published her first work, entitled *A Series of Plays*, in which she attempted to delineate the stronger passions by making each passion the subject of a tragedy and a comedy. The series was followed up by a second volume in 1802, and a third in 1812. A second series appeared in 1836, and a complete edition of her whole dramatic works in 1850. She also published a volume of miscellaneous poetry, including songs, in 1841. Her only plays performed on the stage were a tragedy entitled the *Family Legend*, brought

out at Edinburgh under the patronage of Sir Walter Scott; and *De Montfort*, brought out by John Kemble, who acted in it with Mrs. Siddons.

**BAILLIE, Matthew, M.D.** Physician and anatomist, brother of the preceding, was born 1761 at Shotts, Lanarkshire. died at Cirencester, Gloucestershire, in 1823. In 1773 he was sent to the University of Glasgow. He afterwards studied anatomy under his maternal uncles, John and William Hunter, and entered Oxford, where he graduated as M.D. In 1783 he succeeded his uncle as lecturer on anatomy in London, where he acquired a high reputation as a teacher and demonstrator, having also a large practice. In 1810 he was appointed physician to George III. His work on *The Morbid Anatomy of Some of the Most Important Parts of the Human Body* gave him a European reputation

**BAILLIE, Robert.** An em nent Scottish Presbysterian clergyman, was born at Glasgow in 1599, died 1662. Though educated and ordained as an Episcopalian, he resisted the attempt of Archbishop Laud to introduce his *Book of Common Prayer* into Scotland, and joined the Presbyterian party. In 1638 he represented the presbytery of Irvine in the General Assembly at Glasgow, which dissolved Episcopacy in Scotland. In 1640 he was selected to go to London, with other commissioners, to draw up the accusation against Archbishop Laud Of this, and almost all the other proceedings of his public life, he has left a minute account in his letters and journals, which form a most valuable coll ction for the history of his time. In 1642 he was appointed professor of divinity at Glasgow. He was a member of the Westminster Assembly of Divines, and attended its sittings from 1643-6. After the Restoration, though made principal of his college through Court patronage, he did not hesitate to express his dissatisfaction with the reintroduction of Episcopacy.

**BAILLIE, Robert** of Jerviswood, in Lanarkshire. A Scottish patriot of the reign of Charles II. He brought himself into notice by opposing the tyrannical measures of Archbishop Sharpe against the Nonconformists, for which he was fined 6000 merks (or £500) and imprisoned for four months. In 1683 he went to London in furtherance of a scheme of emigration to South Carolina taken up by a number of Scottish gentlemen as being the only way of escaping the tyranny of the Government. He became associated with Monmouth, Sydney, Russell, and the rest of that party, and was charged with complicity in the Rye-house plot. After a long imprisonment, during which vain attempts were made to obtain evidence against him, he was brought before the Court of Justiciary (23rd Dec., 1684), was found guilty, and condemned to be executed that afternoon.

**BAILLIESTON.** A town of Scotland, in Lanarkshire, a few miles east of Glasgow, with extensive collieries, in which many of the inhabitants are employed. Pop. 5500.

**BAILLY** (bâ-yē), **Jean Sylvain.** French astronomer and statesman, born at Paris 1736. After some youthful essays in verse, he was induced by Lacaille to devote himself to astronomy, and on the death of the latter in 1753, being admitted to the Academy of Sciences, he published a reduction of Lacaille's observations on the zodiacal stars. In 1764 he competed ably but unsuccessfully for the Academy prize offered for an essay upon Jupiter's satellites, Lagrange being his opponent; and in 1771 he published a treatise on the light reflected by these satellites. In the meantime he had won distinction as a man of letters by his *Éloges* on Pierre Corneille, Leibnitz, Molière, and others; and the same qualities of style shown by these were maintained in his *History of Astronomy* (1775-87), his most extensive work. In 1784 the French Academy elected him a member. The revolution drew him into public life. Paris chose him, 12th May, 1789, first deputy of the *tiers-état*, and in the Assembly itself he was made first president, a post occupied by him on 20th June, 1789, in the session of the Tennis Court, when the deputies swore never to separate till they had given France a new constitution. As Mayor of Paris his moderation and impartial enforcement of the law failed to commend themselves to the people, and his forcible suppression of mob violence, 17th July, 1791, aroused a storm which led to his resignation and retreat to Nantes. In 1793 he attempted to join Laplace at Melun but was recognized and sent to Paris, where he was condemned by the revolutionary tribunal, and executed on 12th Nov.

**BAILMENT.** In law, is the delivery of a chattel or thing to a person in trust, either for the use of the bailer or person delivering, or for that of the bailee or person to whom it is delivered. A bailment always supposes the subject to be delivered only for a limited time, at the expiration of which it must be re-delivered to the bailer, the responsibility of the bailee being dependent, in some degree,

upon the contract on which the bailment is made. Pledging and letting for hire are species of bailment. *Agistment*, or the taking in of cattle or live stock to feed at a rate of so much per head, is a contract of bailment.

**BAILY, Edward Hodges.** An English sculptor, born at Bristol 1788, died at London 1867. He became a pupil of Flaxman in 1807, gained the Academy Gold Medal in 1811, and was elected R.A. in 1821. Principal works: *Eve at the Fountain, Eve Listening to the Voice, Maternal Affection, Girl Preparing for the Bath, The Graces*, etc. The bas-reliefs on the south side of the Marble Arch, Hyde Park, the statue of Nelson on the Trafalgar Square monument, and other public works, were by him.

**BAILY, Francis.** Astronomer, born in Berkshire 1774; settled in London as a stockbroker in 1802. While thus actively engaged he published *Tables for the Purchasing and Renewing of Leases, The Doctrine of Interest and Annuities, The Doctrine of Life Annuities and Assurances*, and an epitome of universal history. On retiring from business with an ample fortune in 1825 he turned his attention to astronomy, became one of the founders of the Astronomical Society, contributed to its *Transactions*, and in 1835 published a life of Flamsteed. He died in 1844.

**BAILY'S BEADS.** A phenomenon attending eclipses of the sun, the unobscured edge of which appears discontinuous and broken immediately before and after the moment of complete obscuration. It is classed as an effect of irradiation, and is caused by the sun shining through the depressions between the lunar mountains.

**BAIN, Alexander.** Scottish philosopher and educationalist, was born at Aberdeen in 1818. He was educated at Marischal College (then a separate university), Aberdeen; was for some years a deputy professor in the university; subsequently held official posts in London; and in 1860 was appointed professor of logic and English in Aberdeen University, a post which he held till his resignation in 1881. His most important works are: *The Senses and the Intellect* (1855); *The Emotions and the Will* (1859), together forming a complete exposition of the human mind; *Mental and Moral Science* (1868); *Logic, Deductive and Inductive* (1870); *Mind and Body* (1873); *Education as a Science* (1879); *James Mill, a Biography* (1881); *John Stuart Mill, a Criticism with Personal Recollections* (1882); besides an *English Grammar*; *English Composition and Rhetoric*; an *Autobiography*, etc. Bain was at once grammarian, rhetorician, educationalist, and logician, but his fame rests on his contributions to psychology. He died in 1903.

**BAINSIZZA PLATEAU.** *See* EUROPEAN WAR.

**BAIRAM** (bī'ram). The Easter of the Mohammedans, which follows immediately after the Ramadan or Lent (a month of fasting), and lasts three days. This feast during the course of thirty-three years makes a complete circuit of all the months and seasons, as the Turks reckon by lunar years. Sixty days after this first great Bairam begins the lesser Bairam. They are the only two feasts prescribed by the Mohammedan religion.

**BAIRD, Sir David.** A distinguished British soldier, was born in Aberdeenshire in 1757, and entered the army 1772. Having been promoted to a lieutenancy in 1778 he sailed for India, distinguished himself as a captain in the war against Hyder Ali, was wounded and taken prisoner, and confined in the fortress of Seringapatam for nearly four years. He and his fellow-prisoners were treated with great barbarity, and many of them died or were put to death, but at last (in 1784) all that survived were set at liberty. In 1787 he became major, and in 1791 joined the army under Cornwallis as lieutenant-colonel, and was appointed to the command of a brigade in the war against Tippoo. After much hard service he was made a colonel in 1795, went in 1797 to the Cape of Good Hope as brigadier-general, and in 1798, on his appointment as major-general, returned to India.

In 1799 he commanded the storming party at the assault of Seringapatam, and, in requital, was presented with the State sword of Tippoo Saib. Being appointed in 1800 to command an expedition to Egypt, he landed at Kosseir in June, 1801, crossed the desert, and, embarking on the Nile, descended to Cairo, and thence to Alexandria, which he reached a few days before it surrendered to General Hutchinson. Next year he returned to India, but being soon after superseded by Sir Arthur Wellesley (Wellington), he sailed for Britain, where he was knighted and made K.B. With the rank of lieutenant-general he commanded an expedition in 1805 to the Cape of Good Hope, and in 1806, after defeating the Dutch, he received the surrender of the colony. He commanded a division at the siege of Copenhagen, and after a short

period of service in Ireland sailed with 10,000 men for Corunna, where he formed a junction with Sir John Moore. He commanded the first division of Moore's army, and in the battle of Corunna lost his left arm. By the death of Sir John Moore, Sir David succeeded to the chief command, receiving for the fourth time the thanks of Parliament, and a baronetcy. In 1814 he was made a general. He died in 1829.

**BAIRD, Spencer Fullerton.** American naturalist, born 1823, died 1887. From 1850 to 1878 he was assistant secretary, and then became secretary, of the Smithsonian Institution, Washington, and was also chief Government commissioner of fish and fisheries. He wrote much on natural history, his chief works being *The Birds of North America* (in conjunction with John Cassin), *The Mammals of North America*, *Review of American Birds in the Smithsonian Institution*, and (with Messrs. Brewer and Ridgeway) *History of North American Birds*.

**BAIREUTH** (bī'roit). A well-built and pleasantly-situated town of Bavaria, on the Red Main, 41 miles north-east of Nürnberg. The principal edifices, besides churches, are the old and the new palace, the opera-house, the gymnasium, and the national theatre, constructed after the design of the composer Wagner, and opened in 1876 with a grand performance of his tetralogy of the *Nibelungen Ring*. Industries: cotton-spinning, sugar-refining, musical instruments, sewing-machines, leather, brewing, etc. There is a monument to Jean Paul F. Richter, who died here. Pop. 33,128.

**BAIUS, or DE BAY, Michael.** Catholic theologian, was born 1513, in Hainaut, educated at Louvain, made professor of theology there in 1552, and chosen a member of the Council of Trent in 1563. Leaving the scholastic method, he founded systematic theology directly upon the Bible and the Christian fathers, of whom he particularly followed St. Augustine. His doctrines of original sin and of salvation by grace led to his persecution as a heretic by the old Scotists, and the Jesuits, who succeeded in obtaining a Papal bull in 1567, condemning the doctrines imputed to him. Baius, however, remained in the possession of his dignities, was appointed in 1575 Chancellor of Louvain University; and the King of Spain even conferred upon him the office of Inquisitor-General in the Netherlands. He died in 1589. His Augustinian views descended to the Jansenists, while his doctrine of pure undivided love to God formed the staple of Quietism. His system is called *Baianism*.

**BAIZE.** A sort of coarse woollen fabric with a rough nap, now generally used for linings, and mostly green or red in colour.

**BAJA** (bä'yà). A market town of Hungary, district of Bacs, on the Danube, with a trade in grain and wine, and a large annual hog fair. Pop. 20,361.

**BAJADERES.** *See* BAYADERES.

**BAJAZET** (bà-yà-zet'), or **BAYEZID, I.** Turkish emperor, who, in 1389, having strangled his brother Jacob, succeeded his father Murad or Amurath, who fell in the battle of Kossovo while fighting against the Serbians. From the rapidity of his conquests he received the name of *Ilderim*, the Lightning. In three years he overcame Bulgaria, part of Serbia, Macedonia, Thessaly, and the States of Asia Minor, and besieged Constantinople for ten years, defeating Sigismund and the allied Hungarians, Poles, and French in 1395. The attack of Timur (Tamerlane) on Natolia, in 1400, saved the Greek Empire. Bajazet being defeated and taken prisoner by him near Ancyra, Galatia, 1402. The story of his being carried about in a cage by Timur is improbable; but Bajazet died, in 1409, in Timur's camp, in Caramania. His successor was Soliman I.

**BAJAZET II.** Succeeded his father, Mohammed II., Sultan of the Turks, in 1481. He increased the Turkish Empire by conquests on the N.W. and in the E., took Lepanto, Modon, and Durazzo in a war against the Venetians, and ravaged the coasts of the Christian States on the Mediterranean, to revenge the expulsion of the Moors from Spain. Having abdicated in favour of his younger son Selim, he died on his way to a residence near Adrianople in 1513. He did much for the improvement of his empire and the promotion of the sciences.

**BAJIMONT'S ROLL.** *See* BAGIMONT'S ROLL.

**BAJOCCO, or BAIOCCO** (bà-yok'o). Was a copper coin in the Papal States, the hundredth part of a scudo, or rather more than a halfpenny. The name was also given in Sicily to the Neapolitan *grano*, the hundredth part of the ducato (3s. 4d.).

**BAJUS.** *See* BAIUS.

**BAJZA** (boi'za), **Anton.** Hungarian lyric poet, historian, and critic, born 1804, died 1858. As contributor to and editor of various periodicals he played an important part in the development of modern Hungarian literature and drama. A volume of his

poems, of high merit, was published in 1835. He also translated a collection of foreign dramas, and edited a series of historical works.

**BAKALAHA'RI.** A Bechuana tribe inhabiting the Kalahari Desert, S. Africa.

**BAK'ARGANJ.** A maritime district and town in Eastern Bengal; chief rivers: Ganges, Brahmaputra, and Meghna. Area, 4542 sq. miles; pop. 2,400,000. The town now lies in ruins. Pop. 7000.

**BAKAU** (bä'kou). A town of Roumania, on the Bistritsa. Pop. 16,187.

**BAKCHISERAI** (bâk-chi-sâ-rī'), or **BAGTCHESERAI** (Bakh-chi-Sarai (bäg-che-se-rī; Turk., "Garden Palace"). An ancient town of Russia, in the Crimea, picturesquely situated at the bottom of a narrow valley, hemmed in by precipices. It contains the palace of the ancient Crimean khans, restored by the Russian Government. Pop. 15,000.

**BAKELITE.** A commercial material owing its origin and its name to H. Baekeland, a chemist. It consists of phenols and formaldehyde, and is made hard by the application of heat. It is used for making buttons, umbrella handles and other articles.

**BAKER, Sir Richard.** An English historian, born in Kent in 1568, educated at Oxford, knighted in 1603 by James I., and in 1620 appointed High Sheriff of Oxfordshire, where he had estates. Having given security for a debt incurred by his wife's family, he was thrown into Fleet Prison, where, after remaining some years, he died in 1645. During his imprisonment he wrote some devotional books and his *Chronicle of the Kings of England*, first published in 1641, and afterwards continued by Edward Phillips, the nephew of Milton, and others—a work of great popularity in its day, though of no permanent value.

**BAKER, Sir Samuel White.** A distinguished English traveller, born in 1821. He resided some years in Ceylon; in 1861 began his African travels, which lasted several years, in the Upper Nile regions, and resulted, among other discoveries, in that of Albert Nyanza Lake in 1864, and of the exit of the White Nile from it. In Africa he encountered Speke and Grant after their discovery of the Victoria Nyanza. On his return home he was received with great honour and was knighted. In 1869 he returned to Africa as head of an expedition sent by the Khedive of Egypt to annex and open up to trade a large part of the newly-explored country, being raised to the dignity of pasha. He returned in 1873 having finished his work, and was succeeded by the celebrated Gordon. His writings include: *The Rifle and the Hound in Ceylon*; *Eight Years' Wanderings in Ceylon*; *The Albert Nyanza*; *The Nile Tributaries of Abyssinia*; *Ismailia: a Narrative of the Expedition to Central Africa*; *Cyprus as I saw it in* 1879; also, *Cast up by the Sea*, a story published in 1868. He died 30th Dec., 1893.

**BAKER, Thomas.** Antiquary, born 1656, educated at Cambridge. As a non-juror he lost his living at Long-Newton in 1690, and was compelled to resign his fellowship on the accession of George I., but continued to reside at St. John's College till his death in 1740. His *Reflections on Learning* (1709-10) went through seven editions. He left in MS. forty-two folio volumes of an *Athenæ Cantabrigienses*, from which a *History of St. John's College* was edited by Professor Mayor in 1869.

**BAKEWELL.** An ancient market town, England, county of Derby, between Buxton and Matlock, possessing a fine Gothic church, a chalybeate spring, a cotton-mill erected by Arkwright, and a large marble-cutting industry. Pop. (1931), 3012.

**BAKEWELL, Robert.** An English agriculturist, celebrated for his improvements in the breeding of sheep, cattle, and horses, was born in Leicestershire in 1725, and died in 1795. He commenced experiments in breeding sheep, about 1755, upon his father's farm at Dishley, and for fifty years devoted himself to the acquisition and diffusion of information upon the subject. He was the originator of the new Leicestershire breed of sheep, which has since been so well known, and also of a breed of cattle very famous in their day. The demand for his rams increased so considerably, that whereas he let them for the season at £16 per head in 1755, by 1789 they were hired at 6000 guineas. Various improvements in farm management were also introduced by him.

**BAKHMUT.** *See* BACHMUT.

**BAKHUISEN.** *See* BACKHUYSEN.

**BAKING.** A term meaning "to cook by dry heat," and primarily applied to the baking of bread. A common application of the term is to a mode of cooking food in a close oven, baking in this case being opposed to roasting or broiling, in which an open fire is used. The oven should not be too close, but ought to be properly ventilated. Baking is also

applied to the hardening of earthenware or porcelain by fire. *See* BREAD.

**BAKING POWDER.** A mixture of bicarbonate of soda and tartaric acid, usually with some flour added. The water of the dough causes the liberation of carbonic acid, which makes the bread "rise."

**BAKONY** (bâ-kon'yé) **WALD.** A thickly-wooded mountain range dividing the Hungarian plains, famous for the herds of swine fed on its mast.

**BAKSHEESH'.** An Eastern term for a present or gratuity. A demand for baksheesh meets travellers in the East everywhere from Turkey and Egypt to India.

**BAKU** (bä-kö'). A Russian port on the western shore of the Caspian, occupying part of the Peninsula of Apsheron. The naphtha or petroleum springs of Baku have long been known; and the Field of Fire, so called from emitting inflammable gases, has long been a place of pilgrimage with the Guebres or Fire-worshippers. From the development of the petroleum industry, Baku has greatly increased, and is now a large and flourishing town. About 1500 oil-wells are in operation, producing immense quantities of petroleum (7,000,000 tons annually), much of which is led direct in pipes from the wells to the refineries in Baku, and it is intended to lay a pipe for its conveyance all the way to the Black Sea at Batoum, which is already connected with Baku by railway. Some of the wells have had such an outflow of oil as to be unmanageable, and the Baku petroleum now competes successfully with any other in the markets of the world. Baku, formerly the station of the Caspian fleet, is strongly fortified, and has a large shipping trade. The district of Bakulies within the limits of the Republic of Azerbaijan. Pop. 450,000; pop. of the district, 1,119,600.

**BAKU'NIN, Michael.** Russian anarchist, the founder of Nihilism, born 1814 of a rich and noble family, entered the army, but threw up his commission after two years' service, and studied philosophy at Moscow, with his friends Hertzen, Turgeniev, Granovski (historian), and Byelinski (critic). Having adopted Hegel's system as the basis of a new revolution, he went in 1841 to Berlin, and thence to Dresden, Geneva, and Paris, as the propagandist of anarchism. Wherever he went he caused disturbance, and after undergoing imprisonment in various States, was handed over to Russia in 1851 by Austria, imprisoned for five years, and finally sent to Siberia. Escaping thence through Japan, he joined Hertzen in London on the staff of the *Kolokol*. His extreme views, however, ruined the paper and led to a quarrel with Marx and the Internationale; and having fallen into disrepute with his own party in Russia, he died suddenly and almost alone at Berne in 1878. He demanded the entire abolition of the State as a State, the absolute equilization of individuals, and the extirpation of hereditary rights and of religion, his conception of the next stage of social progress being purely negative and annihilatory.

**BALA.** A lake 4 miles long, and an urban district of N. Wales, in Merionethshire. Pop. 1408

**BALAAM** (bā'lam). A prophet, invited by Balak, King of Moab, to curse the Israelites, but compelled by miracle to bless them instead (Num. xxii.-xxiv.). In another account he is represented as aiding in the perversion of the Israelites to the worship of Baal, and as being, therefore, slain in the Midianitish war (Num. xxxi.; Josh. xiii.). He is the subject of many rabbinical fables, the Targumists and Talmudist regarding him, as most of the fathers did, in the light of an impious and godless man.

**BALA BEDS,** or **BALA SERIES.** A deposit of Upper Ordovician Age, named from the Bala district, North Wales, consisting of slates, grits, sandstones, and limestones, there being two limestones separated by sandy and slaty rocks about 1400 feet thick. They contain trilobites of many species, and other marine fossils. The lower Bala limestone (25 feet thick) may be traced over a large area in North Wales. *See* CARADOC SERIES, ORDOVICIAN SYSTEM.

**BALACHONG'.** An Oriental condiment, composed of small fishes, or shrimps, pounded up with salt and spices and then dried.

**BALÆ'NA.** The genus which includes the Greenland or right whale, type of the family Balænidæ, or whale-bone whales.

**BALÆ'NICEPS** ("whale-head"). A genus of wading birds belonging to the Sudan, intermediate between the herons and storks, and characterized by an enormous bill, broad and swollen, giving the only known species (*B. rex*), also called shoe-bird, a peculiar appearance. It feeds on fishes, water-snakes, carrion, etc., and makes its nest in reeds or grass adjoining water. The bill is yellow, blotched with dark-brown, the general colour of the plumage dusky-grey, the head, neck, and breast slaty, the legs blackish.

**BALÆNOP'TERA.** *See* RORQUAL.

**BALAGARH** (bä-lä-gər'). Town of India, in the Punjab. Pop. 11,233.

**BALAGHAT'.** A district of India, in the Central Provinces, Nagpur division; area, 3132 sq. miles; capital, Burha, a small place. The surface is diversified, comprising extensive uplands as well as lowlands; forests are extensive, and a comparatively small part of the area is under cultivation, rice being the chief crop. Iron exists in considerable quantities, and it is worked in a small way; gold is also worked. Pop. 400,000, almost entirely rural.

**BALAGUER**( bä-lä-gär'), **Victor.** Spanish author and politician, important writer in the Catalonian dialect, born 1824, died 1901. Born at Barcelona, he studied law there, and, becoming learned in Catalonian history, was appointed archivist and soon after professor of history. In 1869 he entered the Cortes as a Liberal; in 1872 was Minister of Public Works; from 1886 to 1888 Colonial Minister. He wrote much both in prose and verse, his prose comprising historical works, novels, etc., his verse lyrics, ballads, tragedies, odes, etc. His tragedies were partly on subjects taken from Catalonian history, partly on subjects connected with Greek and Roman history or literature. Among his lyrical and other poems are: *El Trovador de Montserrat*; *Primavera de Ultimo Trovador Catalan*; *Poesias Completas* (1874); *Obras Poeticas* (1880). *Don Juan de Serrallonga* is the most popular of his novels. Among other works of his are: *Historia Politica y Literaria de los Trovadores*; *Historia de Cataluña*; *Los Pirineos*; *Cristobal Colon*; *Estudios Historicos y Poloticos*; *Historias y Tradiciones*; *Instituciones y Reyes de Aragon*. As a poet he was imitative, reminding us of Quintana, Zorilla, and Byron.

**BALAKLAVA** (bä-lä-klä'vä). A small seaport in the Crimea, 8 miles S.S.E. Sebastopol. In the Crimean war it was captured by the British, who used the harbour as a base of supplies. The famous battle of Balaklava was fought some distance to the north of the seaport, on 25th Oct., 1854. The Russians brought a force of 25,000 men against the allies, a much larger force than they had to encounter, and the chief incidents in the battle were as follows: The Russians captured a series of positions occupied by the Turks in front of the British position; a Russian cavalry charge was repulsed by the 93rd Highlanders; a great mass of Russian cavalry was defeated by a charge of British heavy cavalry; the British light cavalry brigade charged and took a Russian battery, and put to flight the cavalry behind it, but were compelled by overpowering force to retreat with heavy loss, their retreat being covered by a brilliant charge of the French. The celebrated charge of the light brigade, or of the "six hundred," though a brilliant feat of arms, was made under an erroneous interpretation of orders; that of the heavy brigade was equally glorious, and contributed far more to the final repulse of the enemy.

**BALAKO'VO.** A river-port of South-Eastern Russia, on the left bank of the Volga, government of Samara, with a very important trade in grain. Pop. 16,000.

**BALALAI'KA.** A musical instrument of very ancient Slavonic origin, common among the Russians and Tartars. It is a narrow, shallow guitar with only two strings.

**BAL'ANCE.** An instrument for determining the relative weights of bodies. Balances are of various forms; in that most commonly used a horizontal beam rests so as to turn easily upon a fulcrum in the middle. From the extremities of the beam, called the centres of suspension, hang the scales; and a slender metal pointer between them, and in front of the fulcrum, indicates when the beam is level. The characteristics of a good balance are: (1) that the beam should rest in a horizontal position when the scales are either empty or loaded with equal weights; (2) that a very small addition of weight put into either scale should cause the beam to deviate from the level, which property is denominated the sensibility of the balance: (3) that when the beam is deflected from the horizontal position by inequality of the weights on the scales, it should have a tendency speedily to restore itself and come to rest in the level, which property is called the stability of the balance.

To secure these qualities the arms of the beam should be exactly similar, equal in weight and length, and as long as possible; the centres of gravity and suspension should be in one straight line, and the fulcrum immediately above the centre of gravity; and the fulcrum and the centres of suspension should cause as little friction as possible. The fulcrum ought to be a knife-edge; and if the balance requires to be very delicate, the centres of suspension ought to be knife-edges also. If the balance has no tendency to one position more than another, when the scales are either loaded, empty, or off altogether, it is proof that the centre

of gravity and the fulcrum coincide, and the remedy is to lower the centre of gravity. If the beam is disturbed by a small addition of weight to either scale, and exhibits no tendency to resume the horizontal position, we may infer that the centre of gravity is above the fulcrum. If it requires a considerable excess of weight to deflect the beam from the level, we may infer either that there is too much friction at the fulcrum, or that the centre of gravity is too low. If two weights are found to be in equipoise, one being in each scale, and if, when that which is in one scale is put into the other, there is no longer equilibrium, then we may infer that the arms of the beam are of unequal lengths.

For purposes of accuracy, balances have occasionally means of raising or depressing the centre of gravity, of regulating the length of the arms, etc., and the whole apparatus is usually enclosed in a glass case, to prevent the heat from expanding the arms unequally, or currents of air from disturbing the equilibrium. A refinement in weighing is obtained by the use of the milligram rider, a short bent wire which can be moved along a scale engraved on the beam.

Of the other forms of balance, the Roman balance, or steel-yard, consists of a lever moving freely upon a suspended fulcrum, the shorter arm of the lever having a scale or pan attached to it, and the longer arm, along which slides a weight, being graduated to indicate quantities. It is commonly used for weighing loaded carts, for luggage at railway stations, etc. A variety of this, the Danish balance, has the weight fixed at the end of the lever, the fulcrum being movable along the graduated index. The spring-balance registers the weight of an article by the extent to which it draws out or compresses a spiral spring. It is of service where a high degree of exactness is not required, as in its domestic use, and it also finds application in the dynamometer for measuring horse-power of machinery. An extremely ingenious balance, used in the Mint and the Bank of England, for weighing "blanks" and sovereigns, distributes them automatically into three compartments according as they are light, heavy, or the exact weight. The Roberval balance is a form in common use for weighing letters and parcels.—BIBLIOGRAPHY: E. A. Brauer, *The Construction of the Balance*; E. Nicholson, *Men and Measures*: *a history of weights and measures, ancient and modern.*

**BALANCE OF POWER.** A political principle which first came to be recognised in modern Europe in the sixteenth century, though it appears to have been also acted on by the Greeks in ancient times, in preserving the relations between their different States. The object in maintaining the balance of power is to secure the general independence of nations as a whole, by preventing the aggressive attempts of individual States to extend their territory and sway at the expense of weaker countries. The first European monarch whose ambitious designs induced a combination of other States to counteract them was the Emperor Charles V., similar coalitions being formed in the end of the seventeenth century, when the ambition of Louis XIV. excited the fears of Europe, and a century later against the exorbitant power and aggressive schemes of the first Napoleon. Since that time we have the instance of the Crimean War, entered into to check the ambition of Russia.

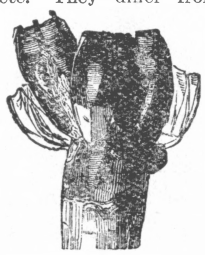
Of late years there has been a marked tendency among British politicians to decry and impugn the principle of the balance of power, as calculated only to propagate a system of mutual hostility, and retard the cause of progress, by the expenditure both of money and life thus occasioned. An equilibrium between the various Powers is, of course, essential to the very existence of international law. The war of 1914-8 has proved to the world that in the absence of any central authority neither treaties nor signatures could prevent a State sufficiently powerful from ignoring the law and acting solely according to its interests and ambitious designs.—BIBLIOGRAPHY: Hume, *Essay on the Balance of Power*; Von Gentz, *Fragments on the Balance of Power*; Professor L. Oppenheim, *International Law*, vol. i.; Vattel, *Le droit des gens.*

**BALANCE OF TRADE.** The difference between the stated money values of the exports and imports of a country. The balance is erroneously said to be "in favour" of a country when the value of the exports is in excess of that of the imports, and "against it" when the imports are in excess of the exports. The phrases date from the days of the mercantile system, the characteristic doctrine of which alleged the desirability of regulating commerce with a view to amassing treasure by exporting produce largely, importing little merchandise in return, and receiving the balance in bullion. In certain conceivable political and industrial conditions this may have had beneficial results; but its importance was greatly overestimated, and the state of this balance came to be regarded

as an invariable criterion of the industrial condition of a country. The false analogy of the successful merchant who gains more than he spends became the basis of popular reasoning, the products of a country being mistakenly identified with its exports, its consumption with its importation.

It is now generally recognized that if bullion be exported from a country it is because it is at the time the cheapest commodity available for export; and further, that there are certain natural limits to its undue exportation, in that the increased scarcity of money is attended with a fall in the money-value of other commodities, which thus in turn become preferable objects of exportation, while bullion flows back. The excess of the value of imports over that of exports, which is regarded by some as an adverse and alarming symptom in British trade, is in large part readily accounted for on the ground of shipping receipts, insurance returns, interest on capital employed in foreign trade, merchants' profits, and the income derived from foreign investments.

**BAL'ANUS** (" acorn-shells "). A genus of sessile cirripeds, family Balanidæ, of which colonies are to be found on rocks at low water, on timbers, crustaceans, shells of mollusca, etc. They differ from the



Group of *Balanus tintinnabulum*

barnacles in having a symmetrical shell, and being destitute of a flexible stalk. The shell consists of six plates, with an operculum of four valves. They pass through a larval state, in which they are not fixed, moving by means of swimming feet which disappear in the final state. All the Balanidæ are hermaphrodite. A South American species (*Balănus psittăcus*) is eaten on the coast of Chile, the *Balănus tintinnabŭlum* by the Chinese. The old Roman epicures esteemed the larger species.

**BALAPUR'.** Town of India, in Akola district, Berar, with strong fort and fine pavilion of black stone. Po 10,500.

**BAL'AS.** A name used to di tinguish the rose-coloured species ruby from the ruby proper.

**BALASOR'.** A seaport tow Hindustan, presidency of Benga province of Orissa, headquarters of district and subdivision bearing th same name. It carries on a cor siderable traffic with Calcutta. Po 21,362.

**BALA'TA.** A gum yielded b *Mimūsops Balata*, a tree growin abundantly in British, French, an Dutch Guiana, Honduras, and Brazil obtained in a milky state by " tap ping " the tree, and hardening to a substance like leather. Used fo similar purposes to india-rubber, and in the United States chewed as a masticatory.

**BAL'ATON,** or **PLATTENSEE.** A lake of Hungary, 55 miles S.W. of Pesth; length, 50 miles; breadth, 3 to 10 miles; area, about 390 sq. miles. Of its thirty-two feeders the Szala is the largest, and the lake communicates with the Danube by the Rivers Sio and Sarviz. It abounds with a species of perch.

**BALBEC.** *See* BAALBEK.

**BALBI, Adrien.** Geographer and statistician, born at Venice in 1782. In 1808 his first work on geography, *Prospetto Politico-Geografico*, procured his appointment as professor of geography in the College of San Michele at Murano, and he became in 1811 professor of natural philosophy in the Lyceum at Fermo. In 1820 he proceeded to Portugal, and collected there materials for his *Essai Statistique sur le Royaume de Portugal et d'Algarve* and *Variétés Politiques et Statistiques de la Monarchie Portugaise*, both published in 1822 at Paris, where he resided till 1832. He then settled in Padua, where he died in 1848. Balbi's admirable *Abrégé de Géographie* was written at Paris, and translated into the principal European languages.

**BALBI, Gasparo.** A Venetian dealer in precious stones, born about the middle of the sixteenth century, who travelled first to Aleppo and thence down the Euphrates and Tigris to the Malabar coast, sailing finally for Pegu, where he remained for two years. His *Viaggio all' Indie Orientale*, published on his return to Venice in 1590, contains the earliest account of India beyond the Ganges.

**BALBO, Cesare.** Italian author and statesman born in 1789 at Turin. After holding one or two posts under the patronage of Napoleon, he de-

voted himself to history, publishing a history of Italy prior to the period of Charlemagne, a compendium of Italian history, etc. His *Speranza d'Italia* (1843), a statement of the political condition of Italy, and of the practicable ideals to be kept in view, gave him a wide reputation. He died in 1853.

**BALBO'A, Vasco Nuñez de.** One of the early Spanish adventurers in the New World, born 1475. Having dissipated his fortune, he went to America, and was at Darien with the expedition of Francisco de Enciso in 1510. An insurrection placed him at the head of the colony, but rumours of a western ocean and of the wealth of Peru led him to cross the isthmus. On 25th Sept., 1513, he saw for the first time the Pacific, and after annexing it to Spain, and acquiring information about Peru, returned to Darien. Here he found himself supplanted by a new governor, Pedrarias Davila, with much consequent grievance on the one side, and much jealousy on the other. Balboa submitted, however, and in the following year was appointed Viceroy of the South Sea. Davila was apparently reconciled to him, and gave him his daughter in marriage, but shortly after, in 1517, had him beheaded on a charge of intent to rebel. Pizarro, who afterwards completed the discovery of Peru, served under Balboa.

**BALBRIGGAN.** A seaport and favourite watering-place, Ireland, county of Dublin; celebrated for its hosiery. Pop. 2300.

**BAL'CONY.** In architecture, is a gallery projecting from the outer wall of a building, supported by columns or brackets, and surrounded by a balustrade. Balconies were not used in Greek and Roman buildings, and in the East the roof of the house has for centuries served similar purposes on a larger scale. Balconies properly so styled came into fashion in Italy in the Middle Ages, and were introduced into Britain in the sixteenth century.

**BAL'DACHIN** (-kin; It. *baldachino*). A canopy or tent-like covering of any material, either suspended from the roof, fastened to the wall, or supported on pillars over altars, thrones, pulpits, beds, portals, etc. Portable baldachins of rich materials were formerly used to shield the heads of dignitaries in processions, and are still so used in the processions of the Roman Catholic Church, and in the East. The enormous bronze baldachin designed by Bernini for Pope Urban VIII., and placed over the tomb of the apostles in St. Peter's at Rome, is one of the most famous, though surpassed in beauty by many in other European cathedrals and churches.

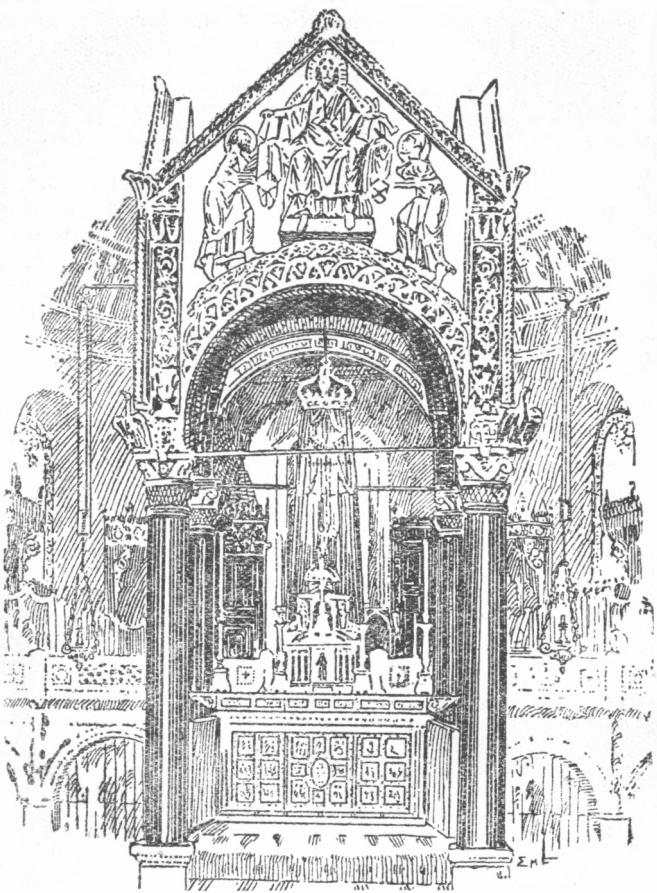
**BALDER, or BALDUR.** A Scandinavian divinity, represented as the son of Odin and Frigga, beautiful, wise, amiable, and beloved by all the gods. His mother took an oath from every creature, and even from every inanimate object, that they would not harm Balder, but omitted the mistletoe. Balder was therefore deemed invulnerable, and the other gods in sport flung stones and shot arrows at him without harming him. But the evil god Loki fashioned an arrow from the mistletoe and got Balder's blind brother Höder to shoot it, himself guiding his aim. Balder fell dead, pierced to the heart, to the deep grief of all the gods. He is believed to be a personification of the brightness and beneficence of the sun.

**BALDI, Bernardino.** Mathematician, theologian, geographer, historian, poet, etc., born at Urbino 1533; studied at Padua; became abbot of Guastalla. He knew upwards of twelve languages, and is said to have written over a hundred works, most of which remain in MS. His works include a poem on *Navigation*, various translations and commentaries, *Lives of Celebrated Mathematicians*, etc. He died in 1617.

**BALDMONEY.** English wallflower. The flowers which many people call by this name are species of the gentian.

**BALDNESS.** Loss of the hair, complete or partial, usually the latter, and due to various causes. Most commonly it results as one of the changes belonging to old age, due to wasting of the skin, hair-sacs, etc. It may occur as a result of some acute disease, or at an unusually early age, without any such cause. In both the latter cases it is due to defective nourishment of the hair, owing to lessened circulation of the blood in the scalp. The best treatment for preventing loss of hair seems to consist in such measures as bathing the head with cold water and drying it by vigorous rubbing with a rough towel and brushing it well with a hard brush. Various stimulating lotions are also recommended, especially those containing cantharides. But probably in most cases senile baldness is unpreventable. When extreme scurfiness of the scalp accompanies loss of the hair, an ointment that will clear away the scurf will prove beneficial.

**BALDOVINET'TI, Alessio.** Florentine artist, born 1427. Few of his works remain except a *Nativity* in the



Baldachin: Church of St. Ambrogio, Milan

church of the Annunziato, and two altar-pieces in the gallery of the Uffizi and the Academy of Arts, Florence. Died 1499. His portrait by himself is in the gallery at Bergamo.

**BALDRIC** (bald'rik). A broad belt formerly worn over the right or left shoulder diagonally across the body, often highly decorated and enriched with gems, and used not only to sustain the sword, dagger, or horn, but also for purposes of ornament, and as a military or heraldic symbol.

**BAL'DUNG, Hans,** or **HANS GRUN** (grün). German painter and wood engraver, born in Swabia 1470, died in Strasbourg 1552. His work, though inferior to Dürer's, possessed many of the same characteristics, and on this account he has been sometimes considered a pupil of the Nuremberg master. His principal paintings are the series of panels (of the date 1516) over the altar in Freiburg Cathedral; others of his works are to be found at Berlin, Colmar, and Basel. His numerous and often fantastic engravings have the monogram H and B, with a small G in the centre of the H.

**BALDWIN I.** Emperor of Constantinople, founder of the short-lived dynasty of Latin sovereigns of the Eastern Empire, was born in 1172, and was hereditary Count of Flanders and Hainault. His courage and conduct in the fourth crusade led to his unanimous election as Emperor of the East after the capture of Constantinople by the French and Venetians in 1204. In the absence of Baldwin's brother with a large part of the army, the Greeks rose in revolt under the instigation of Joannices, King of Bulgaria. Baldwin marched on Adrianople, but was taken prisoner and died in captivity, 1205. Baldwin was succeeded by his brother Henry. —**Baldwin II.,** fifth and last Latin Emperor of Constantinople, was born 1217. During his minority John de Brienne was regent, but on his assuming the power himself the Empire fell to pieces. In 1261 Constantinople was taken by the forces of Michael Palæologus, and Baldwin retired to Italy, dying in 1270.

**BALDWIN I.** King of Jerusalem, reigned 1100-18, having assumed the title which his elder brother, Godfrey de Bouillon, had refused. He subdued Cæsarea, Ashdod, Tripolis, and Acre.—**Baldwin II.,** his cousin and successor, reigned from 1118-31. During his reign the reduction of Tyre and institution of the order of Templars took place.—**Baldwin III.,** King of Jerusalem from 1143 to 1162, was son and successor of Foulques of Anjou, and the embodiment of the best aspects of chivalry. After defeating Noureddin in 1152, and again in 1157, he was enabled to devote himself to the hopeless task of improving the kingdom and establishing the Christian chivalry in the East. His death in 1162 was almost immediately followed by the total collapse of the kingdom.

**BALDWIN, James Mark.** American philosopher, born in Columbia, 12th Jan., 1861. He was educated at Princeton College, Leipzig and Berlin Universities; the instructor of German and French at Princeton College, 1885-7; professor of philosophy in Lake Forest University, 1887-9; professor of psychology at Princeton University, 1893-1903. From 1903-9 he was professor of philosophy and psychology at the Johns Hopkins University, Baltimore. Among his works are: *Handbook of Psychology* (2 vols.); *Mental Development in the Child and the Race.*

**BALDWIN, Stanley.** British statesman, was born 3rd Aug., 1867. He succeeded Bonar Law as Premier in May, 1923, and at the same time became leader of the Unionist party. His Government went to the country in Dec., 1923, over the question of trade protection. As a result of this election the Government lost its majority over the other parties in the House and was defeated. Mr. Baldwin's resignation followed. He became Premier for the second time in Nov., 1924. In 1926 he was elected a Fellow of the Royal Society, and in 1929 became Chancellor of St. Andrews University. In 1931 he took a leading part in the formation of a national government and became Lord President of the Council and deputy Prime Minister. Two volumes of his speeches, *On England* and *Our Inheritance*, have been published.

**BALE, John.** An English ecclesiastic, born in Suffolk in 1495, died in 1563. Although educated a Roman Catholic, he became a Protestant, and the intolerance of the Catholic party drove him to the Netherlands. On the accession of Edward VI. he returned to England, was presented to the living of Bishop's Stoke, Southampton, and soon after nominated Bishop of Ossory, in Ireland. Here, on his preaching the reformed religion, the popular fury against him reached such a pitch that in one tumult five of his domestics were murdered in his presence. On the accession of Mary he lay some time concealed in Dublin, and after many hardships found refuge in Switzerland. At her death he was appointed by Elizabeth a prebend of Canterbury, where he died. His fame as an author rests upon his *Scriptorum Illustrium Majoris Britanniæ Catalogus*, or *An Account of the Lives of Eminent Writers of Britain*, commencing with Japhet the son of Noah, and ending with the year 1557. It is compiled from various writers, chiefly from the antiquary Leland. He was also the author of nineteen miracle plays, printed in 1558. One of his plays, *Kynge Johan*, is a link between the old morality plays and the historical drama.

**BALEAR'IC CRANE** (*Balearica pavonina*). A handsome species of crested crane inhabiting North-West Africa.

**BALEAR'IC ISLANDS.** An archipelago of four large and eleven small islands, south-east of Spain, including Majorca, Minorca, Iviza, and Formentera. The popular derivation of the ancient name Baleares (Gr. *ballein*, to throw) has reference to the repute of the inhabitants for their skill in slinging, in which they distinguished themselves both in the army of Hannibal and under the Romans, by whom the islands were annexed in 123 B.C. After being taken

by the Vandals, under Genseric, and in the eighth century by the Moors, they were taken by James I., King of Aragon, 1220-34, and constituted a kingdom, which in 1343 was united to Spain. The islands now form a Spanish province, with an area of 1935 sq. miles, and 343,653 inhabitants. *See separate articles.*

**BALEN** (bä'len), **Hendrik van.** Painter, born at Antwerp 1560, died 1632. His works, chiefly classical, religious, and allegorical—some of them executed in partnership with Breughel—are to be found in most of the European galleries. He was the first master of Van Dyck and Snyders. Three of his sons also followed the art.

**BALFE** (balf), **Michael William.** Composer, was born in Dublin, 15th May, 1808. In his seventh year he performed in public on the violin, and at sixteen took the part of the Wicked Huntsman in *Der Freischütz* at Drury Lane. In 1825 he went to Italy, wrote the music for a ballet, *La Pérouse*, for the Scala at Milan, and in the following year sang at the Théâtre-Italien, Paris, with moderate success. He returned to Italy, and at Palermo was given his first opera, *I Rivali* (1829). For five years he continued singing and composing operas for the Italian stage. In 1835 he came to England, and composed a number of operas, amongst others *The Bohemian Girl* (1843), *The Rose of Castile* (1857), *Satanella* (1858), and *The Talisman* (first performed in 1874). He died 20th Oct., 1870. His operas are melodious, and many of the airs are excellent.

**BALFOUR** (bal-fōr'), **Sir Andrew, Bart.** A Scottish botanist and physician, born in Fifeshire in 1630. After completing his studies at St. Andrews and London, and travelling on the Continent, he settled at Edinburgh, where he planned, with Sir Robert Sibbald, the Royal College of Physicians, and was elected its first president. He also laid the foundation of a hospital in Edinburgh, which expanded into the Royal Infirmary. He died in 1694. His familiar letters were published in 1700.

**BAL'FOUR, Right Hon. Arthur James, First Earl of** (created 1922). Son of J. M. Balfour of Whittinghame, Haddingtonshire, and of Lady Blanche Cecil, sister of the third Marquess of Salisbury, was born 25th July, 1848, and educated at Eton and Trinity College, Cambridge. He represented Hertford from 1874-5, East Manchester from 1885 to 1906, and had been representative for the City of London since 1906. For a time he was private secretary to his uncle, Lord Salisbury, under whom he was President of the Local Government Board, and afterwards Secretary for Scotland (1886-7), with a seat in the Cabinet. He showed much firmness and ability as Chief Secretary for

Earl Balfour

Ireland during Lord Salisbury's administration from 1887-91. He became leader of the House of Commons and First Lord of the Treasury in 1891-2, and held the position again from 1895 to 1900, and from that year till 1902. From 1902 to 1905 he was Prime Minister. During his term of office the English Education Act was passed.

In the Coalition Government of 1915 he was First Lord of the Admiralty, and in the succeeding one of 1916 he was Foreign Secretary. In 1919 he was sent to the Paris Conference as the second British plenipotentiary, and in the same year held office as Lord President of the Council. He was chief British representative at the first Assembly of the League of Nations, and his work at the Washington Conference in 1919 was of great international importance. In March, 1922, he was created a Knight of the Garter and later an earl. He succeeded the late Lord Curzon as President of the Council in Mr. Baldwin's Cabinet in 1925. He has had a distinguished career in other as well as political spheres. He was President of the British Association in 1904, twice Gifford Lecturer (1913 and 1922), President of the British Academy 1921-9, elected

Chancellor of Cambridge University 1919, in which office he succeeded the late Lord Rayleigh. His published works include: *A Defence of Philosophic Doubt* (1879), *Essays and Addresses* (1893), *The Foundations of Belief* (1895), *Economic Notes on Insular Free Trade* (1903), *Theism and Humanism* (1915), *Theism and Thought* (1925), *Opinions and Argument* (1927). He died on 19th March, 1930.

**BALFOUR, Francis Maitland.** Writer an embryology, brother of the foregoing, born in 1851, early distinguished himself in his special study, and in 1874, in conjunction with Dr. M. Foster, published *The Elements of Embryology*; but the promise of his chief work, *Comparative Embryology* (1880-1) was unfulfilled, as in 1882 he was killed by a fall on Mont Blanc.

**BALFOUR, Sir James.** Scottish lawyer and politician, born about 1522, took part in the conspiracy against Cardinal Beaton, and was condemned with Knox to the galleys; but after his release found it to his interest to change his opinions, and was appointed, through the favour of Queen Mary, Lord of Session and member of the Privy Council. In 1567 he was appointed Governor of Edinburgh Castle, but had no scruple in surrendering it to Murray, who made him President of the Court of Session. He was charged with a share in the murder of Darnley, and helped to bring Regent Morton to his death. He died in 1583. *The Practicks of Scots Law*, attributed to him, was long a textbook.

**BALFOUR, John Hutton.** A distinguished botanist, born 1808, died 1884. He gradu ted at Edinburgh University in arts and in medicine; from 1841 to 1845 was professor of botany in Glasgow University; and in the latter year removed to Edinburgh to occupy a similar post, resigning his chair in 1879. He wrote valuable botanical textbooks, including *Elements*, *Outlines*, *Manual*, and *Class-book*, besides various other works.

**BALFROOSH'**, or **BARFURUSH'**. A town, Persia, province of Mazanderan, about twelve miles from the Caspian, a great emporium of the trade between Persia and Russia. Pop. estimated at 50,000.

**BA'LI.** An island of the Indian Archipelago east of Java, belonging to Holland; greatest length, 85 miles, greatest breadth, 55 miles; area, about 2300 sq. miles. It consists chiefly of a series of volcanic mountains, of which the loftiest, Agoong (11,326 feet), became active in 1843 after a long period of quiescence. Principal products: rice, cocoa, coffee, indigo, cotton, etc. The people are akin to those of Java and are mostly of the Hindu religion. It is divided into eight provinces under native rajahs, and since 1882 has formed one colony with Lombok, the united pop. being 1,500,000, of whom about 960,000 belong to Bali.

**BAL'IOL, or BALLIOL, John de.** Of Barnard Castle, Northumberland, father of King John Baliol, a great English (or Norman) baron in the reign of Henry III., to whose cause he strongly attached himself in his struggles with the barons. In 1263 he laid the foundation of Balliol College, Oxford, which was completed by his widow Devorguila or Devorgilla. She was daughter and co-heiress of Allan of Galloway, a great baron of Scotland by Margaret, eldest daughter of David, Earl of Huntingdon, brother of William the Lion. It was on the strength of this genealogy that his son John Baliol became temporary King of Scotland. He died 1269.

**BAL'IOL, or BALLIOL, John.** King of Scotland, born about 1249, died 1315. On the death of Margaret, the maid of Norway and grandchild of Alexander III., Baliol claimed the vacant throne by virtue of his descent from David, Earl of Huntingdon, brother to William the Lion, King of Scotland (*see above article*). Robert Bruce (grandfather of the king) opposed Baliol; but Edward I.'s decision was in favour of Baliol, who did homage to him for the kingdom, 20th Nov., 1292. Irritated by Edward's harsh exercise of authority, Baliol concluded a treaty with France, then at war with England; but after the defeat at Dunbar he surrendered his crown into the hands of the English monarch. He was sent with his son to the Tower, but, by the intercession of the Pope in 1297, obtained liberty to retire to his Norman estates, where he died.—His son, Edward, in 1332 landed in Fife with an armed force, and, having defeated a large army under the Regent Mar (who was killed), got himself crowned king, but was driven out in three months.

**BALIS'TIDÆ.** *See* TRIGGER-FISHES.

**BALIZE** (ba-lēz'). *See* BELIZE.

**BALK.** This term is used in billiards for a line drawn across the table 28½ in. from the bottom cushion. When the ball is in balk it can only be played at indirectly. Another balk is the ridge of land left unploughed between two ploughed areas. A roughly squared beam of timber is also called a balk.

**BAL'KAN** (ancient, **HÆMUS**). A rugged chain of mountains extending from Cape Emineh, on the Black Sea, in Eastern Roumelia, westwards to the borders of Serbia, though the name is sometimes used to include the whole mountain system from the Black Sea to the Adriatic, the region south of Austria and Russia, or south of the Danube and Save, forming the Balkan Peninsula. The range, which is over 200 miles in length, forms the water-shed between the streams flowing northward into the Danube and those flowing southward to the Ægean, the chief of the latter being the Maritza. The average height is not more than 5000 feet, but the highest point, Tchat-aldagh, is 8340 feet. In the Russo-Turkish war of 1877-8 the Russian troops managed to cross it without great difficulty, though they had to encounter a stubborn resistance at the Shipka Pass, where a Turkish army of 32,000 men ultimately surrendered to them.

**BALKAN LEAGUE, The.** After the annexation of Bosnia and Hercegovina by Austria, in 1908, the Balkan League of Bulgaria, Serbia, Montenegro, and Greece was formed, apparently at the instigation of the Powers of the Triple Entente, primarily to constitute a bulwark against Austrian aggression towards the south-east. The League, however, directed its activities against Turkey, taking advantage of Turkish embarrassments in Libya and of the success of an insurrection in Albania to attempt in 1912 the overthrow of the Turkish regime in Europe. The declaration of hostilities by the League in Oct., 1912, began the First Balkan War (q.v.). The League was maintained during the two campaigns of the war, but jealousy of Bulgarian pre-eminence led to its disruption in June, 1913, when Serbia, Montenegro, and Greece went to war with their former ally.

**BALKAN STATES.** *See* BULGARIA, GREECE, ROMANIA, SERBIA, TURKEY, and YUGOSLAVIA.

**BALKAN WAR, The.** The First Balkan War (Oct., 1912-May, 1913) was the effort of the Balkan League (q.v.) to dismember Turkey in Europe. Each member of the League was allotted a definite strategic object, and each gained a considerable measure of success. Bulgaria defeated the Turks at Kirk Kilisseh and Lule Burgas, and drove them behind the lines of Tchataldja. The Greeks captured Salonica; the Serbians forced their way to the sea at Durazzo. The Montenegrins invested Scutari. An armistice in December was followed by indecisive negotiations, in which the Great Powers took part. Renewed hostilities in the spring of 1913 (during which the Turks lost Adrianople) came to an end with the Treaty of London in May. Before its promises could be carried out, Serbia, Greece, and Romania joined to crush Bulgaria in the Second Balkan War, alleging that her claims to conquered territory in Macedonia were excessive. The Treaty of Bucharest (Aug., 1913) finally concluded the war. The net results were (1) to confine Turkey to Constantinople and the vilayet of Adrianople; (2) to extend Bulgarian territory to the Ægean and to increase greatly both Serbia and Montenegro; (3) to grant Salonica to Greece; (4) to create an autonomous Albania.—BIBLIOGRAPHY: E. Ashmead-Bartlett, *With the Turks in Thrace*; *The Balkan War Drama*, by a Special Correspondent; D. J. Cassvetti, *Hellas and the Balkan Wars*; Sir J. R. L. Rankin, *The Inner History of the Balkan War*.

**BALKASH'**, or **BALKHASH** (bäl-*hâsh'*). A salt lake in Russian Central Asia, surrounded by steppes and plains; length about 330 miles, area 8500 sq. miles, depth nowhere more than 80 feet; formerly of much greater area and gradually growing smaller; receives the Ili and other smaller streams.

**BALKH** (bälk or bäl*h*). A city in the north of Afghanistan, in Afghan Turkistan, at one time the emporium of the trade between India, China, and Western Asia. It was long the centre of Zoroastrianism, and was also an important Buddhist centre. In 1220 it was sacked by Genghis Khan, and again by Timur in the fourteenth century. The remains of the ancient city extend for miles. The town is now merely a village, but a new town has been built an hour's journey north of the old, the residence of the Afghan governor, with a pop. of about 20,000. The district, which formed a portion of ancient Bactria, lies between the Oxus and the Hindu Kush, with Badakshan to the east and the desert to the west. In the vicinity of the Oxus, where there are facilities for irrigation, the soil is rich and productive, and there are many populous villages.

**BAL'KIS.** The Arabian name of the Queen of Sheba who visited Solomon. She is the central figure of innumerable Eastern legends and tales.

**BALL, Game of.** Ball-playing was practised by the ancients, and old and young amused themselves with it. The Phæacian damsels are represented in the *Odyssey* as playing it to the sound of music; and Horace repre-

sents Mæcenas as amusing himself thus during a journey. In the Greek gymnasia, the Roman baths, and in many Roman villas, a *sphæristerium* (a place appropriated for playing ball) was to be found; the games played being similar to those of the present day. In the Middle Ages the sport continued to be very popular both as an indoor and outdoor exercise, and was a favourite Court pastime until about the end of the eighteenth century. In England football and tennis are mentioned at an early date, and a favourite game prior to the English revolution was one in which a *mall* or mallet was used, hence the name *pall-mall* (It. *palla*, Lat. *pila*, a ball) for the game and the place where it was played. The most popular modern forms are cricket, base-ball, football, golf, lawn-tennis, fives, and polo.

**BALL, John.** An itinerant preacher of the fourteenth century, excommunicated about 1367 for promulgating "errors, schisms, and scandals against the Pope, archbishops, bishops and clergy." He was one of the most active promoters of the popular insurgent spirit which found vent under Wat Tyler in 1381, and the couplet

"When Adam delved and Eve span
Who was then the gentleman?"

is attributed to him. He was hanged, drawn, and quartered on 15th July, 1381.

**BALL, Sir Robert Stawell.** Astronomer, born at Dublin 1840, educated at Chester and Trinity College, Dublin. In 1865 he was appointed Lord Rosse's astronomer at Parsonstown, and subsequently held various official posts, including those of Andrews professor of astronomy in the University of Dublin and Astronomer Royal for Ireland (1874), Lowndean professor of astronomy and geometry in the University of Cambridge and director of the observatory (1892). He became F.R.S. in 1873, and was knighted in 1886. Besides many memoirs and articles, he published *The Story of the Heavens*, *Starland*, *In Starry Realms*, *Time and Tide*, *The Story of the Sun*, *Great Astronomers*, *The Earth's Beginning*, *Popular Guide to the Heavens* (numerous plates with accompanying text), *Natural Sources of Power*, etc. He died in 1913.

**BAL'LAD.** A term loosely applied to various poetic forms of the song type, but in its most definite sense a poem in which a short narrative is subjected to simple lyrical treatment. It was, as indicated by its name, which is related to the Low Latin *ballare* and O. French *baller*, to dance, originally a song accompanied by a dance. The ballad, like the nursery tales and the *Märchen*, is probably one of the earliest forms of rhythmic poetic expression, constituting a species of epic in miniature, out of which by fusion and remoulding larger epics were sometimes shaped. Their present form is, of course, relatively recent. As in the folk-tales, so in the ballads of different nations, the resemblances are sufficiently numerous and close to point to the conclusion that they have often had their first origin in the same primitive folk-lore or popular tales. But in any case, excepting a few modern literary ballads of a subtler kind, they have been the popular expression of the broad human emotions clustering about some strongly-outlined incidents of war, love, crime, superstition, or death. It is probable that in the Homeric poems fragments of older ballads are embedded; but the earliest ballads, properly so called, of which we have record were the *ballistea* or dancing-songs of the Romans, of the kind sung in honour of the deeds of Aurelian in the Sarmatic war by a chorus of dancing boys.

In their less specialised sense of lyric narratives, their early popularity among the Teutonic race is evidenced by the testimony of Tacitus, of the Gothic historian Jornandes, and the Lombard historian Paulus Diaconus; and many appear to have been written down by order of Charlemagne and used as a means of education. Of the ballads of this period, however, only a general conception can be formed from their traces in conglomerates like the *Niebelungenlied*; the more artificial productions of the Minnesingers and Meistersingers overlying the more popular ballad until the fifteenth century, when it sprang once more into vigorous life. A third German ballad period was initiated by Bürger, under the inspiration of the revived interest in the subject shown in Great Britain and the publication of the Percy *Reliques*; and the movement was sustained by Herder, Schiller, Goethe, Heine, Uhland, and others. The earlier German work is, however, of inferior value to that of Scandinavia, where, though comparatively few manuscripts have survived, and those not more than three or four centuries old, a more perfect oral tradition has rendered it possible to trace the original stock of the twelfth century.

**Early Ballads.** Of the English and Scottish ballads anterior to the thirteenth century there are few traces beyond the indication that they were abundant, if indeed anything can be definitely asserted of them

earlier than the fourteenth century. Among the oldest may be placed *The Little Gest of Robin Hood*, *Hugh of Lincoln*, *Sir Patrick Spens*, and the *Battle of Otterbourn*. In the fifteenth century specimens multiply rapidly; ballad-making became in the reign of Henry VIII. a fashionable amusement, the king himself setting the example; and though in the reign of Elizabeth ballads came into literary disrepute and ballad singers were brought under the law, yet there was no apparent check upon the rate of their production. Except perhaps in the north of England and south of Scotland, there was, however, a marked and increasing tendency to vulgarization as distinct from the preservation of popular qualities. The value of the better ballads was lost sight of in the flood of dull, rhythmless, and frequently scurrilous verse. The modern revival in Britain dates from the publication of Allan Ramsay's *Evergreen* and *Tea-table Miscellany* (1724-7) and of the selection *Reliques* made by Bishop Percy from his seventeenth-century MS. (1765), a revival not more important for its historic interest than for the influence which it has exercised upon all subsequent poetry.

The threefold wave discernible in German, if not in British, ballad history, is equally to be traced in Spain, which alone among the Latinized countries of Europe has songs of equal age and merit with the British historic ballads. The principal difference between them is, that for the most part the Spanish romance is in trochaic, the British ballad in iambic metre. The ballads of the Cid date from about the end of the twelfth and beginning of the thirteenth century; and then followed an interval of more elaborate production, a revival of ballad interest in the sixteenth century, a new declension, and finally a modern and still-persisting enthusiasm.

The French poetry of this kind never reached any high degree of perfection, the romance, farce, and lyric flourishing at the expense of the ballad proper. Of Italy much the same may be said, though Sicily has supplied a great store of ballads; and nearly all the Portuguese poetry of this kind is to be traced to a Spanish origin. The Russians have lyrico-epic poems, of which some, in old Russian, are excellent, and the Serbians are still in the ballad-producing stage of civilization. Modern Greece has also its store of ballads, published in several collections. In Greece, Russia, and elsewhere the old habit of improvising song as an accompaniment to dance still exists.—BIBLIOGRAPHY: Professor Child, *English and Scotti Popular Ballads*; Professor Gur mere, *The Beginnings of Poetry*; S W. Scott, *Minstrelsy of the Scottis Border* (edited by T. F. Henderson) T. F. Henderson, *The Ballad i Literature*.

**BALLADE** (bal-âd' : The earlier an modern French spelling of *ballad*, bu now limited in its use to a distinc verse-form introduced into Englis literature of late years from th French, and chiefly used by writers o *vers-de-société*. It consists of thre stanzas of eight lines each, with a *envoy* or closing stanza of four lines The rhymes, which are not more tha three, follow each other in the stanza thus : a, b, a, b ; b, c, b, c, and in the envoy, b, c, b, c ; and the same line serves as a refrain to each of the stanzas and to the envoy. There are other varieties, but this may be regarded as the strictest, according to the precedent of Villon and Marot.

**BALLANTRAE.** A village on the west of Ayrshire, Scotland, famous because of its association with R. L. Stevenson's romance, *The Master of Ballantrae*. It is 12 miles from Girvan and its inhabitants are chiefly fishermen. At one time it was noted for its smugglers. Pop. 1100.

**BAL'LANTYNE, James.** The printer of Sir Walter Scott's works, born at Kelso 1772, died at Edinburgh 1833. Successively a solicitor and a printer in his native town, at Scott's suggestion he removed to Edinburgh, where the high perfection to which he had brought the art of printing, and his connection with Scott, secured him a large trade. The printing firm of James Ballantyne & Co. included Scott, James Ballantyne, and his brother John (who died in 1821). For many years he conducted the *Edinburgh Weekly Journal*. His firm was involved in the bankruptcy of Constable & Co., by which Scott's fortunes were wrecked, but Ballantyne was continued by the creditors' trustee in the literary management of the printing house. He survived Scott only about four months.

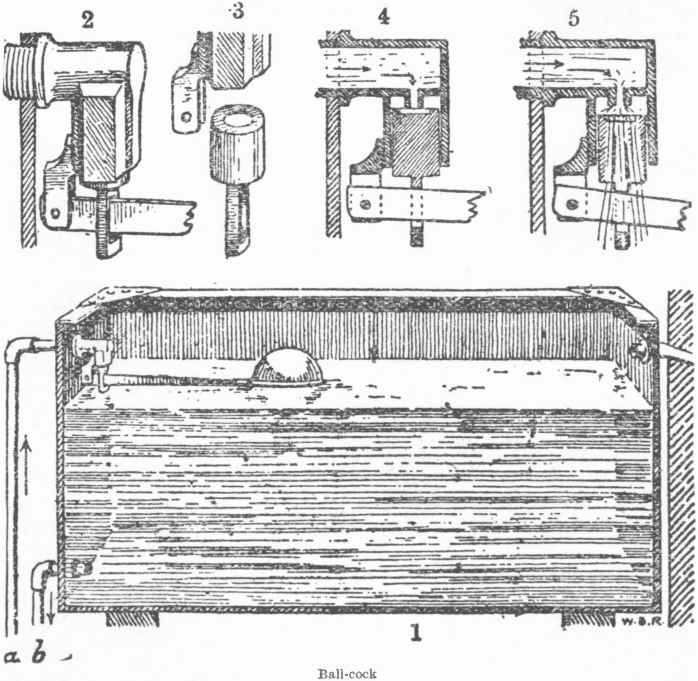
**BALLANTYNE, Robert Michael.** Writer of books for boys, born at Edinburgh 1825, died in Rome 1894, was a nephew of James Ballantyne, the printer of Sir Walter Scott's works. He was for some years in North America in the service of the Hudson's Bay Company, and his experiences there supplied him with materials for some of his earlier books, especially *Hudson's Bay, or Life in the Wilds of North America* (1848); *The Young Fur Traders*; and *Ungava, a Tale of Eskimo Land*.

or many years he continued to roduce popular and instructive boys' ooks, dealing with scenes and sub-ects of the most varied kind ; and he lso published a volume entitled *'ersonal Reminiscences of Book-Making* (1893).

**BALLARAT'**, or **BALLAARAT.** an Australian town in Victoria, chief entre of the gold-mining industry of he colony, and next in importance to Melbourne, from which it is distant N.N.W. about 60 miles direct. It consists of two distinct municipalities, Ballarat West and Ballarat East, separated by the Yarrowee Creek, and has many handsome buildings, and all the institutions of a progressive and flourishing city, including hospital, mechanics' institute and library, free public library, Anglican and Roman Catholic cathedrals, etc. Gold was first discovered in 1851, and the extraordinary richness of the field soon attracted hosts of miners. The surface diggings having been exhausted, the precious metal is now got from greater depths, and there are mines as deep as some coal pits, the gold being obtained by crushing the auriferous quartz. There are also foundries, woollen mills, flour mills, breweries and distilleries, etc. Pop. 39,417.

**BAL'LAST.** A term applied (1) to heavy matter, as stone, sand, iron, or water placed in the bottom of a ship or other vessel to sink it in the water to such a depth as to enable it to carry sufficient sail without oversetting. (2) The sand placed in bags in the car of a balloon to steady it and to enable the aeronaut to lighten the balloon by throwing part of it out. (3) The material used to fill up the space between the rails on a railway in order to make it firm and solid.

**BALL'ATER.** A village and favourite summer resort in Aberdenshire, on the Dee, at the terminus of




Ball-cock

1, Cistern with ball-cock attached : *a*, rising main ; *b*, supply to house. 2, Outside view of valve (cistern full). 3, Piston with rubber disc. 4, Section of valve (cistern full). 5, Section of valve with piston pulled down.

the Deeside Railway, about 43 miles from Aberdeen, a centre from which Balmoral, Lochnagar, Braemar, etc., are easily reached. The Pananich chalybeate springs are adjacent. Pop. (1931), 1198.

**BALL-COCK.** A kind of self-acting stopcock opened and shut by means of a hollow sphere or ball of metal attached to the end of a lever connected with the cock. Such cocks are often employed to regulate the supply of water to cisterns. The ball floats on the water in the cistern by its buoyancy, and rises and sinks as the water rises and sinks, shutting off the water in the one case and letting it on in the other.

**BAL'LENTYNE,** or **BELLENDEN, John.** A Scottish poet; was a native of Lothian, and appears to have been born towards the close of the fifteenth century. He was in the service of James V. from the king's earliest years, and at his request he translated Boece's *Latin History*, which had been published at Paris in 1526, the translation being printed in 1536. As a reward he was made Archdeacon of Moray and a canon of Ross. He was a bitter opponent of the Reformation, and is said to have died at Rome in 1550.

**BALLENY.** A group of five islands in the Antarctic, named after John Balleny, a whale fisher, who discovered them in 1839. There is a volcano, 12,000 ft. high, on one of them.

**BALLET** (bal'ā). A species of dance, usually forming an interlude in theatrical performances, but principally confined to opera. Its object is to represent, by mimic movements and dances, actions, characters, sentiments, passions, and feelings, in which several dancers perform together. The ballet is an invention of modern times, though pantomimic dances were not unknown to the ancients. The dances frequently introduced into operas seldom deserve the name ballet, as they usually do not represent any action, but are destined only to give the dancers an opportunity of showing their skill. The modern ballet was developed and perfected in France, and introduced into England in the eighteenth century. From an artistic point of view, the modern ballet is often a very low-class entertainment.

**BALL-FLOWER.** An architectural ornament resembling a ball placed in a circular flower, the three petals of which form a cup round it; usually inserted in a hollow moulding, and generally characteristic of the Decorated Gothic style of the fourteenth century.

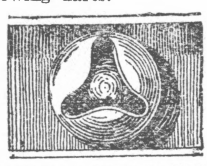
**BALLIA.** A town of India, in the United Provinces, on the Ganges, the administrative headquarters of a district of the same name. Pop. 16,680.

**BALLINA'.** A town and river-port, Irish Free State, County Mayo, on the Moy, about 5 miles above its mouth in Killala Bay, with a considerable local and also a little coasting and foreign trade. Pop. (1926), 4872.

**BALLINASLOE'** (-slō). A town, Irish Free State, in Galway and Roscommon counties, 15 miles southwest of Athlone, on the Suck, noted for its cattle fair, from 5th till 9th Oct., the most important in Ireland. The town contains remains of a castle of Elizabethan date. Pop. (1926), 5243.

**BALLIOL COLLEGE.** College of Oxford University, founded in 1263 by John de Baliol, father of the King of Scotland. Its modern reputation began when many famous men were trained under the mastership of Benjamin Jowett.

**BALLIS'TA.** A machine used in military operations by the ancients for hurling heavy missiles, thus serving in some degree the purpose of the modern cannon. The motive power appears to have been obtained by the torsion of ropes, fibres, catgut, or hair. They are said to have sometimes had an effective range of a quarter of a mile, and to have thrown stones weighing as much as 300 lb. The ballistæ differed from the *catapultæ*, in that the latter were used for throwing darts.



Ball-flower

**BALLIS'TIC PENDULUM.** An apparatus for ascertaining the velocity of military projectiles, and consequently the force of fired gunpowder. A piece of ordnance is fired against bags of sand supported in a strong case or frame suspended so as to swing like a pendulum. The arc through which it vibrates is shown by an index, and the amount of vibration forms a measure of the force or velocity of the ball.

**BALLISTICS.** The science of the motion of projectiles. *Interior ballistics* deals with the motion of the

t while inside the gun, and with the ults of the explosion of the charge. *erior ballistics* comprises a study he trajectory or path of the pro-ile in the air, and the causes which ct the shape of this path, such as density of the air, shape and ght of the shot, rifling of the rel, angle of fire and speed of the jectile. If the air-resistance be lected, it can be shown that the jectory is a *parabola*. This result, en by Galileo, is of little use in mery except when taken along h a knowledge of air-resistance. although the resistance is expressible in terms of a power of the speed, this power changes with the speed. The air-resistance is a maximum at about the speed at which sound travels, viz. 1100 feet per second. Artillerists employ ballistic tables based on the results obtained by Bashforth and others, by means of which, given the kind of projectile, its initial velocity, and angle of fire, they can calculate the range and time of flight of the projectile. *See* GUNNERY.—BIBLIOGRAPHY: F. Bashforth, *The Motion of Projectiles*; J. M. Ingalls, *Interior*

Ballista as used by the Romans

Robins, in 1742, first measured the muzzle-speed of the shot by firing into a ballistic pendulum and noting the swing of the pendulum. Wheatstone, in 1840, suggested measuring the speed by causing the shot to cut successive wire screens, each of which formed part of an electric circuit. The Boulengé chronograph is a modern development of this idea. Rev. F. Bashforth's experiments, carried out between 1865 and 1880, form the basis of our knowledge of air-resistance. He found that the latter was proportional to the square of the diameter of the shot, and that, *Ballistics*; P. Charbonnier, *Balistique Extérieure*.

**BALLOON-FISH** (*Tetraödon lineātus*), ord. Plectognathi. A curious tropical fish that can inflate itself so as to resemble a balloon.

**BALLOONS.** The most elementary form of lighter-than-air aircraft, unprovided with any means of propulsion or steering. Deriving its power of sustentation from the gas contained in the gas-bag, the free balloon is spherical in form. It is usually filled with coal-gas, which has a lifting-force of 35 lb. per 100 cu. feet.

Varying in size from 5000 to 20,000 cu. foot capacity, the gas-bag is covered with a "net," from which is hung the "basket" for the accommodation of the aeronaut, or pilot and passengers. The spherical gas-bag has at the bottom an elongation, known as the "neck," which is open to the air in order that the gas may escape as it expands during the rise into the rarefied atmosphere of the upper air. A "valve" is fitted at the top, which may be opened by a cord from the basket when it is desired to allow gas to escape in order to descend. Bags containing sand are carried in order that ballast may be dropped when it is desired to rise. A free balloon is completely at the mercy of the wind, and simply drifts where the wind takes it.

Balloons are usually constructed of cotton fabric, though occasionally of gold-beater's skin, in which case they are commonly filled with hydrogen in place of coal-gas. A "trail-rope" is usually carried, with which the practice of "trailing" may be effected over open country or the sea. This consists in allowing the end of the trail-rope to drag on the ground. As the balloon rises it raises more of the rope off the ground, the additonal weight bringing it down again. *Per contra*, as it falls the weight of the trail-rope is taken by the ground and so lightens the balloon. This tends to maintain the balloon at a uniform height. The greatest height attained prior to 1931, was 37,000 feet, reached by Glaisher and Coxwell in Sept., 1862. Both aeronauts nearly perished from the effects of the cold and rarefaction of the atmosphere.

In May, 1931, Professor A. Piccard of the University of Brussels and a companion, carrying scientic instruments, reached a height of 15½ kilometres. In a second ascent, in Aug., 1932, Piccard and an assistant rose to a height of 16,700 metres (nearly 10½ miles). In 1895 Parseval and Siegsfield, two officers of the Prussian army, invented the "Drachenballon" or "Kite-balloon" (Fr. *Saucisse*). This was improved upon by Captain Caquot of the French army, who in 1916 produced an improved type, offering many advantages, which was used in large numbers by the British, French, and American armies and navies during the Great European War of 1914-8. *See also* AERONAUTICS; AIRSHIPS.—BIBLIOGRAPHY: *British Military Manual of Ballooning*; Rev. J. M. Bacon, *The Dominion of the Air*; H. Coxwell, *My Life and Balloon Experiences*; J. Glaisher, *Travels in the Air*; G. Tissandier, *Histoire de mes Ascensions*.

**BAL'LOT, Voting by.** Signifies literally voting by means of little b (called by the French *ballottes*), usu of different colours, which are into a box in such a manner as enable the voter, if he chooses, conceal for whom or for what he gi his suffrage. The method is adop by most clubs in the election of th members—a white ball indicat assent, a black ball dissent. Her when an applicant is rejected, he said to be *blackballed*. The term vot by ballot is also applied in a gene way to any method of secret voti as, for instance, when a person gi his vote by means of a ticket beari the name of the candidate whom wishes to support. In this sense v by ballot is the mode adopted electing the members of legislati assemblies in most countries, as w as the members of various oth bodies. In ancient Greece and Ror the ballot was in common use. Britain it had long been advocat in the election of members of Parli ment and of municipal corporatior but it was only introduced by an A passed in 1872.

**BALLYME'NA.** A town of Antri Northern Ireland, 22 miles fro Belfast, with a considerable trade linens and linen yarns, the man facture of which is carried on to great extent. Pop. (1926), 11,875

**BALLYMO'NEY.** A town of A trim, Northern Ireland, 38 miles N.V of Belfast; linen, chemicals, tannin and brewing. Pop. (1926), 3161.

**BALLYSHAN'NON.** A seapor Irish Free State, County Donegal, the Erne, about 1 mile from the S. shore of Donegal Bay. Pop. (1926 2112.

**BALM** (bäm; *Melissa officinălis* A plant, belonging to the Labiat formerly in great repute for i medicinal virtues. A native of t south of Europe, it is cultivated English gardens. It is a herbaceo perennial, with an erect branchi stem about 2 feet high. The leav arise with the flower-stems from thick joint at the extremity of t stalk. The flowers are whitish; th are produced in a round termin umbel, and appear in June. T stems and leaves are slightly stimula ing and tonic. They contain essential oil of a yellowish colour a with a fragrant smell, called oil balm.

**BALM OF GILEAD.** The exudati of a tree, *Balsamodendron gileaden* nat. ord. Amyridaceæ, a native Arabia Felix, and also obtained fro the closely-allied species *Balsamode dron Opobalsămum*. The leaves of t former tree yield when bruised strong aromatic scent; and the bal

Gilead of the shops, or balsam of ca or of Syria, is obtained from it making an incision in its trunk. as a yellowish or greenish colour, a m, bitterish, aromatic taste, and acidulous fragrant smell. It is ued as an odoriferous unguent and metic by the Turks. It is fre-ntly adulterated for market.—e *balm of Gilead fir*, which pro-es a turpentine called Canada sam, is the *Abies balsamifera*, a rth American species, whose range rom Virginia to Canada. The name lerived from Jeremiah viii. 22.

**BALMAIN'.** A populous western burb of Sydney, N.S.W. with ensive docks and various industrial rks. Pop. 33,000.

**BALMER'INO, Arthur Elphinstone, rd.** A Scottish Jacobite, born 1688, ecuted 1746. He took part in the cobite rebellion of 1715, and fought Sheriffmuir. Having joined the ung Pretender in 1745, he was ken prisoner at Culloden, tried at estminster, found guilty, and be-aded. His title was from Balmerino Fife.

**BALMOR'AL CASTLE.** A private sidence of the British sovereign, autifully situated on the S. bank of e Dee, in Aberdeenshire, 45 miles . by S. of Aberdeen. It stands in e midst of fine and varied mountain enery, is built of granite in the cottish baronial style, mainly in two nnected blocks, and has an im-osing appearance. The estate, pur-hased by the Prince Consort in 1852 nd bequeathed to Queen Victoria, xtends to about 40,000 acres, mostly eer forest.

**BALNAVES', Henry, of Halhill,** Scottish reformer, was born at Kirkcaldy, educated at St. Andrews, nd became a lord of session and a nember of the Scottish Parliament in 538. He was one of the commissioners ppointed in 1543 to treat of the pro-osed marriage between Edward VI. nd Mary. In 1547 he was one of the risoners taken in the castle of St. Andrews and exiled to France. Re-alled in 1554, he busily engaged in he establishment of the reformed aith, assisted in revising the *Book of Discipline*, and accompanied Murray to England in connection with Darnley's murder. He died in 1579.

**BALQUHIDDER.** One of Scotland's beauty spots. The Braes of Balquhidder, famous for their connection with Rob Roy, are in Perthshire near Loch Voil. Rob Roy was buried in the village churchyard in 1734.

**BALRAMPUR.** *See* BULRAMPUR.

**BALSA.** A kind of raft or float used on the coasts and rivers of Peru and other parts of South America for fishing, for landing goods and passengers through a heavy surf, and for other purposes where buoyancy is chiefly wanted. It is formed generally of two inflated seal-skins, connected by a sort of platform on which the fisherman, passengers, or goods are placed.

**BAL'SAM.** The common name of succulent plants of the genus Impatiens, family Balsaminaceæ, having beautiful irregular flowers, cultivated in gardens and green-houses. *Impatiens balsamina*, a native of the East Indies, is a common cultivated species. *I. noli-metangere* grows wild in Britain, but is not native. *See* IMPATIENS.

**BALSAM.** An aromatic, resinous substance, flowing spontaneously or by incision from certain plants. A great variety of substances pass under this name. But in chemistry the term is confined to such vegetable juices as consist of resins mixed with volatile oils, and yield the volatile oil on distillation. The resins are produced from the oils by oxidation. A balsam is thus intermediate between a volatile oil and a resin. It is soluble in alcohol and ether, and capable of yielding benzoic acid. The balsams are either liquid or more or less solid; as, for example, the balm of Gilead, and the balsams of copaiba, Peru, and Tolu. Benzoin, dragon's-blood, and storax are not true balsams, though sometimes called so. The balsams are used in perfumery, medicine, and the arts. *See* COPAIBA, etc.—*Balsam of Gilead* or *of Mecca*, balm of Gilead (q.v.).—*Canada balsam*. *See* CANADA BALSAM.

**BALSAM FIR.** *See* BALM OF GILEAD.

**BALSA'MO, Joseph.** *See* CAGLIOSTRO, COUNT.

**BALSA WOOD.** An extremely light Central American wood, used in shipbuilding and in the construction of aircraft. It is white, soft, and lustrous, and is difficult to work.

**BALTA.** A town in the Ukraine, government of Podolia, on the Kodema, an affluent of the Bug, 115 miles N.N.W. of Odessa. Pop. 25,000.

**BALTIC, Battle of the.** *See* COPENHAGEN; PARKER, SIR HYDE.

**BALTIC PROVINCES.** A term commonly given to the former Russian governments of Courland, Livonia, and Esthonia (q.v.).

**BALTIC SEA.** An inland sea or large gulf connected with the North Sea, washing the coasts of Denmark, Germany, Russia, and Sweden; nearly 900 miles long, extending to

200 broad; superficial extent, together with the Gulfs of Bothnia and Finland, 171,743 sq. miles. Its greatest depth is 126 fathoms; mean, 44 fathoms. A chain of islands separates the southern part from the northern, or Gulf of Bothnia. The water of the Baltic is colder and clearer than that of the ocean: it contains a smaller proportion of salt, and the ice obstructs the navigation three or four months in the year.

**Rivers.** Among the rivers that enter it are the Neva, Dwina, Oder, Vistula, and Niemen. Islands: Samsoe, Moen, Bornholm, Langeland, Laaland, which belong to Denmark (besides Zealand and Funen); Gottland and Oeland, belonging to Sweden; Rügen, belonging to Prussia; Dagoe and Oesal, belonging to Russia; and the Åland Islands. The Sound, the Great and the Little Belt lead from the Kattegat into the Baltic. The Baltic and North Sea were long connected by the Eider and a canal from it to the neighbourhood of Kiel, but this has been superseded by the great ship canal, starting from the Elbe near its mouth and ending in Kiel Bay.

**BALTIMORE.** A city and port in Maryland, United States, finely situated on the N. side of the Patapsco, 14 miles above Chesapeake Bay. Baltimore takes its name from Lord Baltimore, the founder of Maryland; it was first laid out as a town in 1729; and was erected into a city in 1797. It is well built, chiefly of brick, and is known as the "monumental city," from the public monuments which adorn it, the principal being the Washington monument.

**Buildings.** Among its buildings are the city hall, built in Renaissance style, of white marble, with a tower and dome rising 240 feet; the Peabody Institute, containing a library, art gallery, etc.; the Maryland Institute; the custom house; the post office; the United States court house and jail, the Johns Hopkins hospital, the Roman Catholic cathedral, etc. The chief educational institution, now one of the most important in the States, is the Johns Hopkins University, endowed with 3,500,000 dollars by its founder (whose name it bears). There is a Roman Catholic archbishop with the rank of primate, and a Protestant episcopal bishop.

**Industries.** Shipbuilding; manufactures of iron, wool, cotton, pottery, etc.; sugar-refining, distilling, tanning, the making of agricultural implements, canning oysters and fruits, etc. As a flour market Baltimore is an important centre; and it does an immense trade in exporting tobacco and other products. The harbour is very extensive. P (1930), 804,874.

Map showing position of Baltimore

**BALTIMORE, George Calvert, Lord** Born in Yorkshire about 1580, die in London 1632. He was for som time Secretary of State to James I. but this post he resigned in 1624 i consequence of having become a Roman Catholic. Notwithstanding this he retained the confidence of the king, who in 1625 raised him to the Irish peerage, his title being from Baltimore, a fishing village of Cork. He had previously obtained a grant of land in Newfoundland, but as this colony was much exposed to the attacks of the French he left it, and obtained another patent for Maryland. He died before the charter was completed, and it was granted to his son Cecil, who deputed the governorship to his brother Leonard (1606-47).

**BALTIMORE BIRD.** An American bird, the *Ictĕrus Baltimorii*, family Icteridæ, nearly allied to the Sturnidæ or starlings. It is a migratory bird, and is known also by the names of "golden robin," "hang-bird," and "fire-bird." It is about 7 inches long; the head and upper parts are

black, the under parts of a brilliant orange hue. It builds a pouch-like nest, very skilfully constructed of threads deftly interwoven, suspended from a forked branch and shaded by overhanging leaves. It feeds on insects, caterpillars, beetles, etc. Its song is a clear, mellow whistle.

**BALUCHISTAN** (ba-lö'chi-stän). A country in Asia, the coast of which is continuous with the north-western seaboard of India, bounded on the north by Afghanistan, on the west by Persia, on the south by the Arabian Sea, and on the east by Sind. It has an area of about 135,000 sq. miles, and a population estimated at 799,625. The general surface of the country is rugged and mountainous, with some extensive intervals of barren sandy deserts, and there is a general deficiency of water. Various kinds of grain are cultivated, and there is abundance of excellent fruits.

The main body of the inhabitants are divided into two great branches, the Baluchis and Brahuis, differing in language, figure, and manners. The Baluchi language resembles the modern Persian, the Brahui presents points of agreement with the Dravidian languages of India. The Baluchis in general have tall figures, long visages, and prominent features; the Brahuis have shorter, thicker bodies, with round faces and rather flat features. Both races are Mahommedans, hospitable and brave. There are also many Afghans and others in the country. The Khan of Kalat, the nominal ruler of the whole land, in 1877 concluded a treaty with Britain, in virtue of which he became a feudatory of India. Since then Quetta, in the north-east, occupying an important position, and certain portions of territory, have been absolutely annexed, and in 1887 a separate administration was constituted, and British authority established, under the Governor-General's agent.

The area of British Baluchistan, including tribal areas, is 54,228 sq. miles; pop. 420,648. The country nominally under the Khan of Kalat has an area of 73,278 sq. miles; pop. 328,281. Under British administration roads and railways have been made, with telegraphs and a postal service. Wool, fruits, etc., are exported, cottons and other goods imported, and there is a fair transit trade.—BIBLIOGRAPHY: Floyer, *Unexplored Baluchistan*; T. Thornton, *Life of Sandeman*.

**BAL'USTER.** A small column or pilaster, of various forms and dimensions, often adorned with mouldings, used for balustrades.

**BALUSTRADE'.** A range of balusters, together with the cornice or coping which they support, used as a parapet for bridges or the roofs of buildings, or as a mere ornament; also serving as a fence or enclosure for balconies, terraces, staircases, etc.

**BALUZE** (bà-lüz), **Étienne.** French historian and miscellaneous writer, born 1630, died 1718. For more than thirty years he was librarian to M. de Colbert, and was appointed professor of canon law in the Royal College, but displeasing Louis XIV. with his *Histoire Généraie de la Maison d'Auvergne*, he was thrown into prison and his property confiscated. He recovered his liberty in 1713, but did not regain his position. He left some 1500 MSS. in the national library of Paris, besides forty-five printed works, including *Regum Francorum Capitularia* (2 vols.) and *Miscellanea* (7 vols.).

**BALZAC** (bàl-zàk), **Honoré de.** A celebrated French novelist, was born at Tours in 1799, died 1850. Before completing his twenty-fourth year he

Honoré de Balzac

had published a number of novels under various assumed names, but the success attending all was very indifferent; and it was not till 1829, by the publication of *Le Dernier Chouan*, a tale of La Vendée, and the first novel to which Balzac appended his name, that the attention of the public was diverted to the extraordinary genius of the author. A still greater popularity attended his *Physiologie de Mariage*, a work full of piquant and caustic observations on human nature. He wrote a large number of novels, all marked by a singular knowledge of human nature and distinct delineation of character, but apt to be marred by exaggeration.

Among his best-known works are : *Scènes de la Vie de Province*, *Scènes de la Vie Parisienne*, *Le Père Goriot*, *Eugénie Grandet*, and *Le Médecin de Campagne*. The publication of this last, in 1835, led to a correspondence between Balzac and the Countess Eveline de Hanska, a Polish lady whom, after about fifteen years, he visited and married. A collected edition of his works, under the title *La Comédie Humaine*, was published in 45 vols., Paris, 1856-9, and another in 1869. In 1899 appeared the first volume of Balzac's *Œuvres Posthumes*, and in 1906 the second.—BIBLIOGRAPHY : F. Wedmore, *Balzac* ; M. F. Sandars, *Balzac* ; W. H. Helm, *Aspects of Balzac* ; Taine, *Essay on Balzac*.

**BALZAC** (bál-zák), **Jean Louis Guez de.** French writer, born 1594, died 1654. His writings, which had a great reputation in their day owing to the elegance of his style, are now neglected. The most esteemed are his *Familiar Letters*, *Le Prince*, *Le Socrate Chrétien*, and *Aristippe*.

**BAMAKO.** Capital of the French colony of Upper Senegal and Niger since 1904. It is an important trade centre and the terminus of the Niger-Senegal railway. Pop. 16,000.

**BAMBA.** A district of the Congo, W. coast of Africa, lying to the south of the River Ambriz. It is thickly populated, and is rich in gold, silver, copper, salt, etc.

**BAMBAR'RA.** A former territory of Western Africa, on the Upper Niger, first visited by Mungo Park, now in the French portion of the Sudan. The country is generally very fertile, producing wheat, rice, maize, yams, etc. The inhabitants are of negro or mixed race, and some are Mahommedans. Excellent cotton cloth is made. The chief town is Segou. Pop. estimated at 2,000,000.

**BAM'BERG.** A town of Germany, Bavaria, charmingly situated on several hills, on the navigable River Regnitz, some 3 miles from its mouth in the Main. It is the seat of a Catholic archbishop ; the cathedral, founded in 1004 (the present structure dates from 1111), is one of the finest churches in Germany. The royal library contains 100,000 volumes and valuable MSS. Bamberg carries on a large trade ; its industries are cotton-spinning, tobacco manufacture, brewing, etc. Pop. (1925), 50,152.

**BAMBINO** (bám-bē'nō ; It., an infant). The figure of our Saviour represented as an infant in swaddling clothes. The *Santissimo Bambino* in the church of Ara Cœli at Rome, a richly-decorated figure carved in wood, is believed to be able to perform miracles and heal the sick. According to popular belief, the painting was miraculously done by St. Luke or by an angel. Bambinos are set up for the adoration of the faithful in many places in Catholic countries.

**BAMBOCCIADES** (bam-boch-ādz'). Pictures, generally grotesque, of common, rustic, or low life, such as those of Peter Van Laar, a Dutch painter of the seventeenth century, who on account of his deformity was called *Bamboccio* (cripple). Teniers is the great master of this style.

**BAMBOO'.** The common name of the arborescent grasses belonging to the genus Bambūsa. There are many

Bamboo (*Bambusa arundinacea*)

species, belonging to the warmer parts of Asia, Africa, and America, and growing from a few feet to as much as 100 feet, requiring much moisture to thrive properly. A peculiarity of the bamboo family is that they flower on reaching a certain age, generally about 130 years. The best-known species is *B. arundinacea*, common in tropical and sub-tropical regions. From the creeping underground rhizome, which is long, thick, and jointed, spring several round jointed stalks, which send out from their joints several shoots, the stalks also being armed at their joints with one or two sharp rigid spines. The oval leaves, 8 or 9 inches long, are placed on short footstalks. The

flowers grow in large panicles from the joints of the stalk. Some stems grow to 8 or 10 inches in diameter, and are so hard and durable as to be used for building purposes.

The smaller stalks are used for walking-sticks, flutes, etc.; and indeed the plant is used for innumerable purposes in the East Indies, China, and other Eastern countries. Cottages are almost wholly made of it. also, bridges, boxes, water-pipes, ladders, fences, bows and arrows, spears, baskets, mats, paper, masts for boats, etc. The young shoots may be either pickled or salted and eaten with rice, or candied and preserved in sugar; the seeds of some species are also eaten. The substance called *tabasheer* is a siliceous deposit that gathers at the internodes of the stems. The bamboo is imported into Europe for various purposes, and is grown in British gardens.

**BAMBOOK'.** A country in Western Africa between the Falémé and Senegal Rivers, about 140 miles in length, by 80 to 100 in breadth. It is on the whole hilly and somewhat rugged. The valleys and plains are remarkably fertile. The natives are Mandingoes, mostly professed Mahommedans ruled by independent chieftains, most of whom acknowledge the supremacy of France. Gold and ivory are exchanged for European goods.

**BAMBOOK-BUTTER.** Shea-butter (q.v.).

**BAM'BOROUGH CASTLE.** An ancient English castle on the coast of Northumberland, formerly with connected estate the property of the Forsters, and forfeited to the Crown in 1715, both being purchased by Lord Crewe, Bishop of Durham, and bequeathed by him for charitable purposes.

**BAMBU'SA.** *See* BAMBOO.

**BAM'IAN.** A valley and pass of Afghanistan, the latter at an elevation of 8496 feet, the only known pass over the Hindu Kush for artillery and heavy transport. The valley is one of the chief centres of Buddhist worship, and contains two remarkable colossal statues and other ancient monuments.

**BAMO.** *See* BHAMO.

**BAMPTON LECTURES.** A course of lectures established in 1751 by John Bampton, Canon of Salisbury, who bequeathed certain property to the University of Oxford for the endowment of eight divinity lectures to be annually delivered. The subjects prescribed are mainly connected with the evidences of Christianity, and the lecturer must have taken the degree of M.A. at Oxford or Cambridge. The first course of lectures was delivered in 1780, and they have been delivered every year since, with the exceptions of 1834, 1835, and 1841. Among the more remarkable lectures were those by Dr. White in 1784, by Dr. Mant in 1812, by Reginald Heber in 1815, Whately in 1822, Milman in 1827, Dr. Hampden in 1832, H. L. Mansel in 1858, Canon Liddon in 1866, Canon Gore in 1891, J. R. Illingworth in 1894, and W. R. Inge in 1899. A similar course of lectures, the Hulsean, is annually delivered at Cambridge.

**BAN.** In political law, is equivalent to excommunication in ecclesiastical. In Teutonic history the *ban* was an edict of interdiction or proscription: thus, to put a prince under the ban of the empire was to divest him of his dignities, and to interdict all intercourse and all offices of humanity with the offender. Sometimes whole cities have been put under the *ban*, that is, deprived of their rights and privileges.

**BAN.** Anciently, a title given to the military chiefs who guarded the eastern marches of Hungary; till 1919 the title of the Governor of Croatia and Slavonia. A province over which a ban is placed is called *banat*, and is equivalent to the German term *mark*. During the European War, Serbia occupied the banat to the south of Hungary, and her claims to that region were disputed both by Hungary and Romania. The territory is bounded almost entirely by the Danube, Theiss, and Maros Rivers, except on the east, where it is shut in by the Transylvanian Carpathians. The banat was ultimately divided between Yugoslavia and Roumania. *See* TEMISOARA

**BANA'NA.** A plant of the genus Musa, nat. ord. Musaceæ, being *M. sapientum*, while the plantain is *M. paradisiaca*. It is originally indigenous to the East Indies, and an herbaceous plant with an underground stem. The apparent stem, which is sometimes as high as 30 feet, is formed of the closely-compacted sheaths of the leaves. The leaves are 6 to 10 feet long and 1 or more broad, with a strong midrib, from which the veins are given off at right angles; they are used for thatch, basket-making, etc., besides yielding a useful fibre. The spikes of the flowers grow nearly 4 feet long, in bunches, covered with purple-coloured bracts. The fruit is 4 to 10 or 12 inches long, and 1 inch or more in diameter; it grows in large bunches, weighing often from 40 to 80 lb. The pulp is soft and of a luscious taste; when ripe it is eaten

Banana (*Musa sapientum*)

raw or cooked. The banana is cultivated in tropical and sub-tropical countries, and is the food of millions. It is estimated that in Jamaica alone 40,000 acres are devoted to its culture. Excellent biscuits may be made from banana meal, but it is not suitable for bread. Vast quantities are imported by Britain and the United States. Manila hemp is the product of a species of banana.

**BANA'NA.** An African port, in Belgian Congo, at the mouth of the Congo.

**BANANA-BIRD.** A pretty insessorial bird (*Ictĕrus leucoptĕryx*), a native of the West Indies and the warmer parts of America. It is a lively bird, easily domesticated, tawny and black in colour, with white bars upon the wings.

**BANAT.** *See* BAN.

**BAN'BRIDGE.** A town of Northern Ireland, County Down, 22 miles S.W. of Belfast, on the Bann. The manufacture of linen is carried on in the town and neighbourhood. Pop. (1926), 4852.

**BANBURY** (ban'be-ri). A town of England, in Oxfordshire, long celebrated for its cheese, its cakes, and its ale; a parliamentary borough till 1885, and now giving name to a parliamentary division of the county. Pop. (municipal borough) (1931), 13,953.

**BANCA.** An island belonging to the Dutch East Indies, between Sumatra and Borneo; area, 4549 sq. miles; pop. 154,141, of which a considerable proportion are Chinese. It is celebrated for its excellent tin, of which the annual yield is above 6000 tons; but it produces nothing else of any importance.

**BANCO.** In commerce, a term employed to designate the money in which the banks of some countries keep or kept their accounts, in contradistinction to the current money of the place, which might vary in value or consist of light and foreign coins. The term was applied to the Hamburg bank accounts before the adoption (in 1873) of the New German coinage. The mark *banco* had a value of **1s.** 5½*d.*, but there was no corresponding coin. *See* BANK.

**BAN'CROFT, George.** American historian, born near Worcester, Mass., 1800, died 1891. He was educated at Harvard and in Germany, where he made the acquaintance of many literary men of note. In 1823 he published a translation of Heeren's *Politics of Ancient Greece*, and a small volume of poems, and was also meditating and collecting materials for a history of the United States.

Between 1834 and 1840 three volumes of his history were published. In 1845 he was appointed Secretary of the Navy, and effected many reforms and improvements in that department. He was American ambassador to Britain from 1846 to 1849, when the University of Oxford conferred on him the honorary degree of D.C.L. He took the opportunity while in Europe to perfect his collections on American history.

He returned to New York in 1849, and began to prepare for the press the fourth and fifth volumes of his history, which appeared in 1852. The sixth appeared in 1854, the seventh in 1858, the eighth soon after, but the ninth did not appear till 1866. From 1867 to 1874 he was Minister Plenipotentiary at the Court of Berlin. The tenth and last volume of his great work appeared in 1874. An additional section appeared first as a separate work in 1882 : *History of the Formation of the Constitution of the United States*, and the whole came out in 6 vols. in 1884-5. He has also published many essays in the *North American Review* and other periodicals, a selection from which was published in 1855 under the title of *Miscellanies*.

**BAN'CROFT, Richard.** Born in Lancashire 1544, died 1610, studied at Cambridge, entered the Church, and rose rapidly during the reign of Elizabeth till he obtained the see of London in 1597. James I. made him Archbishop of Canterbury on the death of Whitgift. He suppressed the Puritans mercilessly, and they in return never ceased to abuse him.

**BAN'CROFT, Sir Squire.** English actor, born in London in 1841. After playing in Dublin and elsewhere he made his first appearance in London at the Prince of Wales's Theatre, in 1865. He married Miss Marie Effie Wilton in 1867, and was knighted in 1897. In collaboration with his wife he has written *The Bancrofts : Recollections of Sixty Years* (1909). He died in 1926.

**BANDA.** A town and district of India, in the United Provinces. The town stands on a plain on the right bank of the Ken River, 95 miles S.W. from Allahabad, and is a considerable cotton mart. Pop. 22,000.—Area of district 3061 sq. miles. Pop. 657,000.

**BANDA ISLANDS.** A group belonging to Holland, Indian Archipelago, south of Ceram, Great Banda, the largest, being 12 miles long by 2 broad. They are beautiful islands, of volcanic origin, yielding quantities of nutmeg. Goenong Api, or Fire Mountain, is a cone-shaped volcano which rises 2320 feet above the sea. Pop. 10,000.

**BANDAJAN'.** A pass over a range of the Himálaya, Kashmir State, 14,854 feet above sea-level.

**BANDAN'NA.** A variety of silk handkerchief having a uniformly-dyed ground, usually of bright red or blue, ornamented with white or yellow circular, lozenge-shaped, or other simple figures produced by discharging the ground colour.

**BANDA ORIENTAL.** *See* URUGUAY.

**BANDEL'LO, Matteo.** An Italian writer of *novelle* or tales, born about 1480, died about 1562. He was, in his youth, a Dominican monk, and having been banished from Italy as a partisan of the French, Henry II. of France gave him in 1550 the bishopric of Agen. He left the administration of his diocese to the Bishop of Grasse, and employed himself, at the advanced age of seventy, in the completion of his *novelle*. He also wrote poetry, but his fame rests on his *novelle*, which are in the style of Boccaccio's *Decameron* and the Queen of Navarre's *Heptameron*, and have been made use of by Shakespeare, Massinger, and Beaumont and Fletcher.

**BANDE NOIRE.** *See* FRENCH REVOLUTION.

**BANDERILLERO.** Participant in a bull fight. They are the men who plunge banderillas, or small darts, into the bull to enrage him and make him fight.

**BAND-FISH.** The popular name of fishes of the genus Cepŏla, from their long, flat, thin bodies. *C. rubescens*, a very fragile creature, is sometimes cast up on British shores. Also called *Snake-fish*, *Ribbon-fish*.

**BAN'DICOOT** (Perameles). A genus of small Australian marsupials. The most common species (*P. nasuta*), the long-nosed bandicoot, measures about 1½ feet from the tip of the snout to the root of the tail. It is not unlike an overgrown rat, and is most destructive to farm produce.

Pig-footed Bandicoot (*Chæropus castanotis*)

**BAN'DICOOT RAT.** The *Mus giganteus*, the largest known species of rat, attaining the weight of 2 or 3 lb., and the length, including the tail, of 24 to 30 inches. It is a native of India, and is very abundant in Ceylon. Its flesh is said to be delicate and to resemble young pork, and is a favourite article of diet with the coolies. It is destructive upon rice-fields and gardens.

**BANDINEL'LI, Baccio.** Italian sculptor, born at Florence 1493, died there 1560. He was jealous of and strove to rival Michelangelo. Among his works are a *Hercules and Cacus*, *The Dead Body of Christ held up by an Angel*, *Adam and Eve*, etc.

**BAN'DIT,** It. *bandito*. Originally an *exile*, banished man, or outlaw, and hence, as persons outlawed frequently adopted the profession of brigand or highwayman, the word came to be synonymous with brigand, and is now applied to members of the organized gangs which infest some districts of Italy, Sicily, Spain, Greece, and Turkey.

**BAND OF HOPE.** *See* TEMPERANCE.

**BAN'DOLIER.** A large leathern belt or baldrick, to which were attached a bag for balls and a number of pipes or cases of wood or metal covered with leather, each containing a charge of gunpowder. It was worn by ancient musketeers, and hung from the left shoulder under the right arm with the ball bag at the lower extremity, and the pipes suspended on either side. The name is now given to a similar belt, worn by mounted troops, for carrying cartridges. Another form of the word is *bandoleer*.

**BAN'DOLINE.** A gummy perfumed substance used to impart gloss and stiffness to the hair.

**BAN'DON.** A town, Irish Free State, County Cork, on the Bandon. Pop. (1926), 2816.

**BANDS.** A small article of clerical dress, made of linen, going round the neck and hanging down in front for a short distance in two pieces with square ends, supposed to be a relic of the amice.

**BANDY.** A form of hockey played on the ice. The sticks, or bandies, used are about four feet long, and the ball, or cat, is of hard rubber.

**BANEBERRY,** or **HERB CHRISTOPHER** (*Actæa spicata*). A European plant, ord. Ranunculaceæ, local in England, with a spike of white flowers and black, poisonous berries. Two American species are considered remedies for rattlesnake bite.

**BANÉR** (bå-nār'), **Johan Gustafsson.** A Swedish general in the Thirty Years' War, born 1596, died 1641. He made his first campaigns in Poland and Russia, and accompanied Gustavus Adolphus, who held him in high esteem, to Germany. After the death of Gustavus in 1632 he had the chief command of the Swedish army, and in 1634 invaded Bohemia, defeated the Saxons at Wittstock, 24th Sept., 1636, and took Torgau. He ravaged Saxony again in 1639, gained another victory at Chemnitz, and in 1640 defeated Piccolomini. In Jan., 1641, he very nearly took Ratisbon by surprise.

**BANFF** (bamf). County town of Banffshire, Scotland, a seaport on the Moray Firth at the mouth of the Deveron. It is well built, carries on some boat-building, and has rope-works, a brewery, etc., fishing and shipping. Near the town are the county lunatic asylum, and Duff House, a seat of the Duke of Fife, now public property; on the east side of the Deveron is the town of Macduff, where an extensive fishing trade is carried on. Banff is one of the Elgin burghs, which return a member to Parliament. Pop. (1931), 3489. The county has an area of 403,053 acres. In the south it is mountainous; but the northern part is comparatively low and fertile; principal rivers, the Spey and Deveron; principal mountains, Cairngorm (4095 feet) and Ben Macdhui (4296 feet), on its southern boundary. Little wheat is raised, the principal crops being barley, oats, turnips, and potatoes. Fishing is an important industry; as is also the distilling of whisky. Serpentine abounds in several places, especially at Portsoy, where it is known as "Portsoy marble," and Scotch topazes or cairngorm stones are found on the mountains in the south. Banffshire returns one member to Parliament. Pop. (1931), 54,835.

**BANFF.** A town of N.W. Canada, at the foot of the Rocky Mountains, on the Canadian Pacific Railway, with National Park, hot springs, coal mines, etc.

**BANG.** *See* BHANG.

**BANGALORE'.** A town, India, administrative headquarters of Mysore, and giving name to a district in the east of Mysore State. The town stands on a healthy plateau 3000 feet above sea-level, has a total area of nearly 14 sq. miles, and is one of the pleasantest British stations in India. In the old town stands the fort, reconstructed by Hyder Ali in 1761, and taken by Lord Cornwallis in 1791. Under English administration the town has greatly prospered in recent times. There are manufactures of

silks, cotton cloth, carpets, gold and silver lace, etc. Pop. 237,496.—The Bangalore district has an area of 3070 sq. miles, of which more than half represent cultivable land. Pop. about 760,000.

**BANGKOK', or BANKOK.** The capital of the kingdom of Siam, extending for several miles on both sides of the Menam, which falls into the Gulf of Siam about 15 miles below. The inner city occupies an island surrounded with walls and bastions, and contains the palace of the king and other important buildings. The dwellings of the common people are of wood or bamboo, often raised on piles; a large portion of the population, however, dwell in boats or wooden houses erected on bamboo rafts moored in the river, and forming a floating town. Temples are numerous and lavishly decorated. Houses in the European style have been erected in modern times, and the telegraph, telephone, gas, fire-engines, and omnibuses introduced. A university with eight faculties has recently been established. The trade, both inland and foreign, is very extensive, the exports consisting chiefly of rice, sugar, silk, cotton, tobacco, pepper, sesame, ivory, aromatic wood, cabinet woods, tin, hides, etc.; and the imports consisting chiefly of British cotton, woollen, and other goods. Pop. 628,675, of whom about a half are Chinese. *See* SIAM.

**BAN'GOR.** A city of North Wales, in Carnarvonshire, picturesquely situated near the northern entrance of the Menai Strait. It appears to have possessed a cathedral in the sixth century, which was destroyed by the Normans in 1071. The present cathedral—the third—only dates from the reign of Henry VII. It has a college of the University of Wales (founded in 1903), and a Normal College. Bangor has risen into importance as a popular resort; its principal trade is in the export of slates from the neighbouring quarries. Pop. (1931), 10,959.

**BAN'GOR.** A seaport, Northern Ireland, County Down, on the south side of Belfast Lough. Principal trade: cotton, linen, and embroideries. Pop. (1926), 11,032.

**BAN'GOR.** A port of the United States, in Maine, on the W. side of Penobscot River, a flourishing and pleasantly-situated town, and one of the largest lumber depots in the world. The river is navigable to the town for vessels of the largest size. Pop. (1920), 25,948.

**BANGO'RIAN CONTROVERSY.** A controversy stirred up by a sermon preached before George I. in 1717 by Dr. Hoadly, Bishop of Bangor, from the text "My kingdom is not of this world" (John xviii. 36), in which the bishop contended in the most pronounced manner for the spiritual nature of Christ's kingdom. The controversy was carried on with great heat for many years, and resulted in an enormous collection of pamphlets.

**BANGS'RING.** *See* BANXRING.

**BANGWEU'LU, or BANGWEOLO, LAKE.** In South Africa, the southernmost of the great lake reservoirs of the Congo, heard of in 1798, was reached by Livingstone in 1868, an oval-shaped shallow sheet of water, said to be 150 miles in length along its greater axis, from east to west, and about 75 miles in width, but its exact limits are uncertain. It was first circumnavigated by Poulett Weatherley in 1896. *See* CONGO.

**BAN'IAN, or BAN'YAN.** An Indian trader or merchant, one engaged in commerce generally, but more particularly one of the great traders of Western India, as in the seaports of Bombay, Kurrachee, etc., who carry on a large trade by means of caravans with the interior of Asia, and with Africa by vessels. They form a class of the Vaisya caste, wear a peculiar dress, and are strict in the observance of fasts and in abstaining from the use of flesh. Hence, *Banian days*, days in which sailors in the navy had no flesh meat served out to them. Banian days are now abolished, but the term is still applied to days of poor fare.

**BANIAN TREE.** *See* BANYAN.

**BA'NIM, John.** An Irish novelist, dramatist, and poet, born in 1798, died 1842. His chief early work was a poem, *The Cell's Paradise* (1821). Having settled in London, he made various contributions to magazines and to the stage; but his fame rests on his novels, particularly the *O'Hara Tales*, in which Irish life is admirably portrayed. In these, as in some of his other publications, his brother, Michael Banim (born 1796, died 1874), had an important share, if not an equal claim to praise. The two brothers have been justly called "the first national novelists of Ireland."

**BANISHMENT.** *See* EXILE.

**BAN'JERMASIN.** A district and town in the south-east of Borneo, under the government of the Dutch. The town is situated on an arm of the Banjar, about 14 miles above its mouth, in a marshy locality, the houses being built on piles, and many of them on rafts. Exports: pepper, benzoin, bezoar, ratans, dragon's-

blood, birds'-nests, etc.; imports: rice, salt, sugar, opium, etc. Pop. 52,000, mostly Dyaks.

**BAN'JO** (a negro corruption of *bandore*; It. *pandora*, from Lat. *pandura*, a three-stringed instrument). The favourite musical instrument of the negroes of the Southern States of America. It is six-stringed, has a body like a tambourine and a neck like a guitar, and is played by stopping the strings with the fingers of the left hand and twitching or striking them with the fingers of the right. The upper or octave string, however, is never stopped. The banjo was introduced into England in 1846.

**BANJOEMAS** (bân'yŏ-mâs). A town in Java, near the centre of the island, well built and of commercial importance; it is 22 miles from the coast, and is the residence of a Dutch governor. Pop. 6500.

**BANKING AND BANKS.** Banks are establishments for the deposit, custody, and repayment on demand of money, and obtain the bulk of their profits from the investment of sums thus derived and not in immediate demand. The term is a derivative of the *banco* or bench of the early Italian money-dealers, being analogous in its origin to the terms *trapezitai* (*trapeza*, a bench or table) applied to the ancient Greek money-changers, and *mensarii* (*mensa*, a table) applied to the public bankers of Rome.

In respect of constitution there is a broad division of banks into public and private; public banks including such establishments as are under any special state of municipal control or patronage, or whose capital is in the form of stock or shares which are bought and sold in the open market; private banks embracing those which are carried on by one or more individuals without special authority or charter and under the laws regulating ordinary trading companies. In respect of function three kinds of banks may be discriminated: (1) banks of deposit merely, receiving and returning money at the convenience of depositors; (2) banks of discount or loan, borrowing money on deposit and lending it in the discount of promissory notes, bills of exchange, and negotiable securities; (3) banks of circulation or issue, which give currency to promissory notes of their own, payable to bearer and serving as a medium of exchange within the sphere of their banking operations. The more highly-organised banks discharge all three functions, but all modern banks unite the two first.

For the successful working of a banking establishment certain resources other than the deposits are of course necessary, and the capital paid up by shareholders on their shares and forming the substantial portion of their claim to public credit is held upon a different footing from the sums received from depositors. It is usually considered that for sound banking this capital should not be traded with for the purpose of making gain in the same way as the moneys deposited in the bank; and it is for the most part invested in Government or other securities subject to little fluctuation in value and readily convertible into money. But in any case prudence demands that a *reserve* be kept sufficient to meet all probable requirements of customers in event of commercial crises or minor panics.

The reserve of the banking department of the Bank of England is always in coin, or in notes against which an equivalent value of coin and bullion is lying in the issue department. In other English banks the reserve is usually kept partly in gold and partly in Government stocks and Bank of England notes; but it sometimes lies as a deposit in the Bank of England. The working capital proper of a bank is constituted by moneys on deposit, for which the bank may or may not pay interest; the advantages of security, of ease in the transmission of payments, etc., being regarded in the cases of banks little affected by competition as a sufficient return to the depositor. Thus the Bank of England pays no interest on deposits, while the contrary practice has prevailed in Scotland since 1729, where interest is paid on deposits although not on current accounts.

**Advances.** Of the methods of making profit upon the money of depositors, one of the most common is to advance it in the discounting of bills of exchange not having long periods (seldom more than three months with the Bank of England) to run; the banker receiving the amounts of the bills from the acceptors when the bills arrive at maturity. Loans or advances are also often made by bankers upon exchequer bills or other Government securities, on railway debentures or the stock of public companies of various kinds, as well as upon goods lying in public warehouses, the dock-warrant or certificate of ownership being transferred to the banker in security. In the case of a well-established credit they may be advanced upon notes of hand without other security. Money is less commonly advanced by bankers upon mortgages on land, in which the

money loaned is almost invariably locked up for a number of years. To banks of issue a further source of profit is open in their note circulation, inasmuch as the bank is enabled to lend these notes, or promises to pay, as if they were so much money and to receive interest on the loan accordingly, as well as to make a profitable use of the money or property that may be received in exchange for its notes, so long as the latter remain in circulation.

It is obvious, however, that this interest on its loaned notes may not run over a very extended period, in that the person to whom they are issued may at once return them to the bank to lie there as a deposit and so may actually draw interest on them from the bank of issue; or he may present them to be exchanged for coin, or by putting them at once into circulation may ensure a certain number speedily finding their way back through other hands or other banks to the establishment from which he received them. A considerable number of the notes issued will, however, be retained in circulation at the convenience of the public as a medium of exchange; and on this circulating portion a clear profit accrues. This rapid return of notes through other banks, etc., in exchange for portions of the reserve of the issuing bank, is one of the restraints upon an issue of notes in excess of the ability of the bank to meet them.

In the United Kingdom a more obvious restraint upon an unlimited note issue, originating partly in a desire for greater security, partly in the belief that the note augmentation of the currency might lead to harmful economic results in its influence upon prices, is to be found in the Bank Acts of 1844 and 1845, which impose upon banks of issue the necessity of keeping an equivalent in gold for all notes issued beyond a certain fixed amount. The wisdom of these legal restrictions, which are not uniform throughout the kingdom, and the desirability of the acquisition and control by the State of the whole business of issue, are still matters of debate.

In specific relation to his customer the banker occupies the position of debtor to creditor, holding money which the customer may demand at any time in whole or in part by means of a cheque payable at sight on presentation during banking hours. For the refusal to cash a cheque from the erroneous supposition that he has no funds of his customer's in his hands, of for misleading statements respecting the position in which the bank stands, the banker is legally responsible. Moreover, the law regards him as bound to know his customer's signature, and the loss falls upon him in event of his cashing a forged cheque. In their relations to the community, the chief services rendered by banks are the following: By receiving deposits of money they are the means by which the surplus capital of one part of a country is transferred to another where it may be advantageously employed in stimulating industry; they enable vast and numerous money transactions to be carried on without the intervention of coin or notes at all, thus obviating trouble, risk, and expense. The mechanism by which the last of these benefits is secured is to be found in perfection in the London Clearing House.

The modern tendency of banks is towards amalgamation. The large English banking institutions have absorbed many of the smaller banks. They have also made working arrangements with Scotch and Irish banks and with similar institutions abroad.

The result of these amalgamations is to give control of immense financial resources to a smaller number of banks. In 1918 the Government appointed a Committee to inquire into the effect of such amalgamations and absorptions. The terms of reference were: "To consider and report to what extent, if at all, amalgamations between banks may affect prejudicially the interests of the industrial and mercantile community, and whether it is desirable that legislation should be introduced to prohibit such amalgamations or to provide safeguards under which they might continue to be permitted"; and the Committee reported: "That legislation be passed requiring that the prior approval of the Government must be obtained before any amalgamations are announced or carried into effect."

In order, however, that such legislation may not have the effect of producing secret amalgamations, the Committee decided that "all proposals for agreements which would alter the status of a bank as regards its separate entity and control, or for purchase by one bank of the shares of another bank, be also submitted for the prior approval of the Government before they are carried out."

Another development is the registration of the British Overseas Bank, Limited, with a nominal capital of £5,000,000. The principal object of this institution is to carry on general banking business in all parts of the world. Four banks—two English, one Scotch, and one having connections with South America—

are financially interested in the Overseas Bank.

**Early Banking.** Banking operations on a considerable scale appear to have been conducted by the ancients, and recent excavations have proved that in the seventh century B.C. banking was practised at Bagdad by a firm of Egibi & Sons. Modern banking, however, must be regarded as having had an independent origin in the reviving civilization of the Middle Ages. In the twelfth century almost the whole trade of Europe was in the hands of the Italian cities, and it was in these that the need of bankers was first felt. The earliest public bank, that of Venice, established in 1171 and existing down to the dissolution of the Republic in 1797, was for some time a bank of deposit only, the Government being responsible for the deposits, and the whole capital being in effect a public loan. In the early periods of the operations of this bank deposits could not be withdrawn, but the depositor had a credit at the bank to the amount deposited, this credit being transferable to another person in place of money payment. Subsequently deposits were allowed to be withdrawn, the original system proving inconvenient outside the Venetian boundaries.

It is, however, less from the Bank of Venice than from the Florentine bankers of the sixteenth and fourteenth centuries that modern banking specially dates, the magnitude of their operations being indicated by the fact that between 1430 and 1433, 76 bankers of Florence issued on loan nearly 5,000,000 gold florins. The Bank of St. George at Genoa also furnished a striking chapter in financial history. The important Bank of Amsterdam, taken by Adam Smith as a type of the older banks, was established in 1609, and owed its origin to the fluctuation and uncertainty induced by the clipped and worn currency. The object of the institution (established under guarantee of the city) was to give a certain and unquestionable value to a bill on Amsterdam; and for this purpose the various coins were received in deposit at the bank at their real value in standard coin, less a small charge for recoinage and expense of management. For the amount deposited a credit was opened on the books of the bank, by the transfer of which payments could be made, this so-called *bank money* being of uniform value as representing money at the mint standard. It bore, therefore, an *agio* or premium above the worn-coin currency, and it was legally compulsory to make all payments of 600 guilders and upwards in bank money. The deposits were supposed to remain in the coffers of the bank, but they were secretly traded with in the eighteenth century till the collapse of the bank in 1790.

Banks of a similar character were established at Nuremberg and other towns, the most important being the Bank of Hamburg, founded in 1619. In England there was no corresponding institution, the London merchants being in the habit of lodging their money at the Mint in the Tower, until Charles I. appropriated the whole of it (£200,000) in 1640. Thenceforth they lodged it with the goldsmiths, who began to do banking business in a small way, encouraging deposits by allowing interest for their use, lending money for short periods, discounting bills, etc. The bank-note was first invented and issued in 1690 by the Bank of Stockholm, founded by Palmstruck in 1688, and one of the most successful of banking establishments. About the same time the banks of England and Scotland began to take shape, opening up a new era in the financing of commerce and industry.

**Bank of England.** The Bank of England, the most important banking establishment in the world, was projected by William Paterson, who was afterwards the promoter of the disastrous Darien scheme. It was the first public bank in the United Kingdom, and was chartered in 1694 by an Act which, among other things, secured certain recompenses to such persons as should advance the sum of £1,500,000 towards carrying on the war against France. Subscribers to the loan became, under the Act, stockholders, to the amount of their respective subscriptions, in the capital stock of a corporation, denominated the *Governor and Company of the Bank of England*. The company thus formed advanced to the Government £1,200,000 at an interest of 8 per cent —the Government making an additional bonus or allowance to the bank of £4000 annually for the management of this loan (which, in fact, constituted the capital of the bank), and for settling the interest and making transfers, etc., among the various stockholders. This bank, like that of Venice, was thus originally an engine of the Government, and not a mere commercial establishment. Its capital has been added to from time to time, the original capital of £1,200,000 having increased to £14,553,000 in 1816, since which no further augmentation has taken place.

There exists besides, however, a variable "rest" of over £3,000,000. The charter of the bank was originally granted for eleven years certain, or

till a year's notice after 1st Aug., 1705. It was subsequently renewed for various periods in 1697, 1708, 1713, 1742, 1764, 1781, 1800, 1833, and 1844, certain conditions which the bank had to fulfil being specified at each renewal. On this last occasion it was continued till twelve months' notice from 1855. At the same time the issue department of the bank was established as distinct from the general banking department, the sole business entrusted to the former being the issue of notes. By this arrangement the bank was authorized to issue notes to the value of £14,000,000 upon securities specially set apart, the most important of the securities being the sum of £11,015,100 due to the bank by the Government, together with so much of the coin and bullion

" Issue Department " and the " Banking Department." In the Issue Department the only item on the debit side of the account is " notes issued," against which is set the amount of the Government debt and other securities, the balance being gold coin and bullion. Section 11 of the Bank Charter Act fixes the bank's authorized issue against securities of £14,000,000, of which the Government debt of £11,015,100 forms a part. The other securities, amounting to £7,434,900, have been raised to this amount partly by the bank exercising the right under Section 5 of the Bank Charter Act to issue up to two-thirds the note issues of provincial banks who have ceased to issue their own notes through their amalgamation or absorption by one

ISSUE DEPARTMENT. Week ending 11th August, 1920

| *Dr.* | | *Cr.* | | |
|---|---|---|---|---|
| Notes issued | £139,980,460 | Government debt | | £11,015,100 |
| | | Other securities | | 7,434,900 |
| | | Gold coin and bullion | | 121,530,460 |
| | | Silver bullion | | — |
| | £139,980,460 | | | £139,980,460 |

BANKING DEPARTMENT

| *Dr.* | | *Cr.* | |
|---|---|---|---|
| Capital | £14,553,000 | Government securities | £68,250,449 |
| Rest | 3,458,795 | Other securities | 73,805,565 |
| Public deposits | 15,999,059 | Notes | 14,452,665 |
| Other deposits | 124,018,988 | Gold and silver coin | 1,537,092 |
| Seven-day and other bills | 15,929 | | |
| | £158,045,771 | | £158,045,771 |

then held by the bank as was not required by the banking department. The bank has since been permitted to increase its issue on securities to £18,450,000, but for every note that the issue department may issue beyond the total sum of £18,450,000 an equivalent amount of coin or bullion must be paid into the coffers of the bank. For its special privileges the bank has to pay to the Government an annual sum of £180,000, and the profit derived from the issue of notes beyond £14,000,000.

The Bank of England notes are practically equivalent to gold. They are (like all English bank-notes) of the value of £5 and upwards, and are legal tender throughout England. Notes once issued by the bank and returned to it are not reissued, but are destroyed—a system adopted in order to prevent forgery. On 7th Aug., 1914, Government notes for £1 and ten shillings were issued convertible into gold at the Bank of England. These were withdrawn in 1928 and Bank of England notes of similar value substituted.

In compliance with the Bank Charter Act of 1844 the Bank of England is compelled to publish a weekly account, of which the form above is a specimen, divided into the

or other of the large joint-stock banks. This part of the note issue, amounting to £18,450,000, is known as the *fiduciary* circulation.

**The Banking Department** is the one that most concerns the money market, as the amount of the notes and gold and silver coin appearing on the credit side of the account is what forms the reserves and governs to a large extent the bank rate. The total of the notes given out by the " Issue Department " is called the " issue circulation," the portion in the hands of the public the " active circulation," and that stil in the Banking Department the " note reserve." Of the other items in the account it may be noted that the proprietors' " rest " is a varying surplus increased always by accumulated profits up to 5th April and 10th Oct., when the bank dividends are paid to the shareholders; and that the public deposits, which include sums lodged on account of the customs, inland revenue, etc., increase through revenue receipts until the dividend terms in January, April, July, and October. The other or private deposits comprise those of bankers, merchants, and other persons. An increase in these private deposits indicates an increase of monetary

ease, while a decrease informs us that bankers, merchants, and traders have calls upon them for money.

A better indication of the demand for money is furnished, however, by the advances on commercial securities, and it is by this and the condition of the reserve that the bank rate of discount is regulated. When the reserve is high and the advances moderate the discount rate is low, and it is raised according as the reserve falls and advances are more in request, especially during an adverse foreign exchange and drain of gold. Gold is thus restrained from going abroad, and its influx into the country is encouraged. In addition to the profit which the bank may make by ordinary banking business, by the Bank Act of 1892 and the Revenue Act of 1906, it receives an allowance for the management of the national debt, at the rate of £325 per million on 500 millions, and £100 per million on all debt above that sum. The annual sum is not to be less than £160,000. It also derives a profit from foreign gold coin and bullion brought to it, for which it pays £3, 17*s.* 9*d.*, or 1½*d.* per ounce less than the real value.

**Management.** The mangement of the bank is in the hands of a governor, deputy-governor, and twenty-four directors, elected by stock-holders who have held £500 of stock for six months previous to the election. A director is required to hold £2000, a deputy-governor £3000, and a governor £4000 of the stock. The court or board of directors meets every Thursday, when the weekly account is presented. The Bank of England has branches in Liverpool, Manchester, Newcastle, Birmingham, Leeds, Hull, Bristol, Plymouth, and Portsmouth.

The other English banks consist of large joint-stock banks and numerous private banks in London and the provinces with branches throughout the country. The total paid-up capital and reserves of the English joint-stock banks is about £100,000,000.

**The Bankers' Clearing House** is the medium through which banks adjust their mutual claims by collecting the amount of their bills and cheques or by settling the balance.

**Scotland.** In Scotland there are no private banks, the only banks in that portion of the United Kingdom being eight joint-stock banks of issue and their branches (the Mercantile and Savings not being banks of issue). By the Act of 1845 new banks of issue were prohibited, a monopoly being given to such establishments (nineteen in number) as existed in the year previous to 1st May, 1845. At the same time the issue of each was limited to the amount of its average circulation during that year, together with the specie held at the head office. Any bank issuing notes in excess of this limit is supposed to hold an equivalent amount of gold. The aggregate authorized circulation is now £2,676,350; the average actual circulation is fully £7,000,000. The Bank of Scotland, established by Act of Parliament in 1695, had for its original capital only £100,000, increased to £200,000 in 1744; but it now has a capital of £1,325,000 paid up. It remained the only bank in Scotland till the Royal Bank of Scotland was established in 1727, with an original capital of £151,000, which has grown to £2,000,000 paid up. The British Linen Company was incorporated in 1746, for the purpose of promoting the linen manufacture, but soon became a general banking company; capital, £1,250,000 paid up. These three banks claim to be by their charters banks of limited liability.

All the other Scottish banks have been established within the nineteenth century. They are all incorporated by royal charter or Act of Parliament, which enables them to sue and be sued as a corporation, and latterly they have all become banks of limited liability, except that their liability is not to be limited in respect to their note issue. The total paid-up capital of the Scotch banks is £9,300,000. A large number of one-pound notes circulate in Scotland, thus tending to keep the requirements for gold low. From allowing a moderate rate of interest on deposit accounts (although not on current accounts) it is not uncommon for depositors in Scottish banks to lodge their money permanently as an investment; and the habit of keeping an account with a banker is much more general in Scotland than in England, branch offices of the banks being very numerous.

Several of the Scotch banks have branch offices in London, but of course they cannot issue their own notes from these offices. The Scotch banks have enjoyed a high reputation for stability, and though public confidence was somewhat shaken by the failure of the Western Bank in 1857, and even more rudely by that of the City of Glasgow Bank in 1878, their shares are generally looked upon as a safe and remunerative investment. Their total deposits amount to fully £107,000,000.

**Ireland.** The banks in Ireland consist of one public or national bank, the Bank of Ireland, and of sundry joint-stock and private banks. The authorized note circulation is ar-

ranged on the same footing as that of the Scotch banks. If any bank discontinues its issue and issues notes of the Bank of Ireland, the circulation of the latter may be to an equal amount increased. The authorized circulation is £6,354,494; the actual circulation is sometimes a little above, sometimes a little below. The Bank of Ireland, which was established by charter in 1783 with similar privileges to those granted to the Bank of England, has lent the greater portion of its capital to Government. Its capital is £2,769,230 (or £3,000,000 Irish); it has also a rest or reserve of over £1,000 000. The bank allows interest on deposits when lodged for a stated period.

**Banque de France.** The Bank of France is second in importance only to the Bank of England. It was established in the beginning of the nineteenth century, at first with a capital of 45,000,000 francs, and with the exclusive privilege in Paris of issuing notes payable to bearer, a privilege which was extended in 1848 to cover the whole of France. It has numerous branches in the larger towns, a number of these having been acquired in 1848, when certain joint-stock banks of issue were by Government decree incorporated with the Bank of France, the capital of which was then increased to 91,250,000 francs (£3,650,000), in 91,250 shares of 1000 francs each. In 1857 the capital was doubled, and besides this it has a large surplus capital or rest. Like the Bank of England, it is a bank of deposit, discount, and circulation, and is a large creditor of the State. The Government appoints the governor and the two deputy-governors, who are all required to be stock-holders. There is also a body of fifteen directors and three censors, nominated by the shareholders. The value of its note circulation in March, 1922, was 36,225,852,000 francs.

**British Colonies.** With regard to the banks in British colonies little need be said. All the more important are joint-stock concerns, and they are carried on subject to Acts passed by the respective colonial legislatures. Some of them have their head-quarters in London, and have been established by English capital. In Canada the banks are not allowed to issue notes of lower denominations than five dollars, notes for one and two dollars and higher amounts being issued by the Dominion Government; and the banking laws are such that there is no possibility of holders of bank-notes being losers by them. The total paid-up capital of the Canadian banks is about £20,000,000; their total deposits about £135,000,000.

**United States.** The more important of the banks of the United States are what are called national banks, established in accordance with an Act passed in 1863. Associations of this kind at starting must invest at least a third of their paid-up capital in Government bonds, which pay them an interest of 4 per cent more or less. They then obtain from the Government bureau, established for the purpose, 90 per cent of paper-money sheets, which they sign and pay out, this constituting their note circulation. These banks pay no interest to depositors. Besides the notes of these banks a large portion of the currency of the United States consists of Government notes issued from the national treasury. There are also banks chartered by the different States and private banks.

**Savings-banks** are banks established for the receiving of small sums, so as to be taken advantage of by the poorer classes, and they are carried on entirely for the benefit of the depositors. They are of comparatively recent origin, one of the earliest having been an institution in which shall sums were received, and interest allowed on them, established by Mrs. Priscilla Wakefield, at Tottenham, near London, in 1803. The first savings-bank in Scotland was formed in 1810 by the Rev. Henry Duncan, of Ruthwell, Dumfriesshire. In 1814 the Edinburgh savings-bank was established on the same principles, and the system soon spread over the kingdom. The first Act relating to savings-banks was passed in 1817. By it all deposits in savings-banks, as soon as they reached £50, were placed in the hands of the National Debt Commissioners, who allowed interest on them. In 1824 it was enacted that the deposits for the first year should not exceed £50, nor those in subsequent years £30, the total deposits being limited to £150, and interest ceasing to be paid when accrued interest made the total £200.

By the Act of 1893 the limit of annual deposit was raised to £50, and the interest is now rather less than 3 per cent. An Act of 1833 had provided for the purchase of Government annuities by depositors either for life or for a term of years; and an annuity of any amount up to £100 may now be obtained. Depositors in savings-banks (by an Act of 1880) can also have their money invested for them in Government stock, the banks collecting and paying the dividends; and when accrued interest raises an account above £200 the excess is now so invested for the depositor. The total amount invested by one person in Government stock is not to exceed

£500, nor £200 in one year. These banks are managed by local trustees having no personal interest in the business, and by certain paid officers.

**Post Office Savings-banks.** A new class of savings-banks, namely, *Post Office Savings-banks*, was established in Britain in connection with the money-order department of the Post Office in 1861. Any sum not less than a shilling is received, provided that the total amount banked does not exceed £50 in one year, or more than £200 in all; the excess of accrued interest above this being invested in Government stock. Interest is paid on every complete pound at the rate of 2½ per cent. For the deposits the Government is responsible, and they may be drawn from any Post Office Savings-bank in the kingdom. These savings-banks have become very numerous, and much of the funds formerly in the trustees' savings-banks has been transferred to them. The total amount deposited in the old banks is now about £52,000,000, in the new about £157,600,000. The regulations regarding the purchase of Government stock and annuities correspond with those given above. Savings-banks are now well known in all civilized countries, and the good they have done is incalculable. In the United States there is an enormous amount of money deposited in them. Post Office Savings-banks have been proposed to be established in the States, but have not yet been so. In Canada, Australia, and other British colonies they are established, as well as savings-banks of several other kinds. School savings-banks are the most recent institutions of this kind, and have had a marked effect for good.

**Bank Holidays.** In England and Ireland, Good Friday, Easter Monday, Whit Monday, first Monday in August, Christmas and following day, or 27th (if next day is a Sunday); in Scotland, New-Year's Day, first Monday of May and August, and Christmas.

**BANKET.** A kind of rock. The most prolific source of gold is the rock in what is called banket formation, as that of the Rand.

**BANKRUPT** (from It. *banca rotta*, "bank broken" or "bench broken": Dr. Johnson said that the word originated from the Italian custom of breaking the bench of an insolvent money-changer; but *rotta* also means "interrupted" or "stopped," and is here used more in the sense of our colloquial word *broken*, and means "insolvent"). A person of whom the law does or may take cognizance as unable to pay his debts. Properly it is of narrower signification than *insolvent*, an insolvent person simply being unable to pay all his debts.

In England up till 1861 the term *bankrupt* was limited to an insolvent trader, and such traders were on a different footing from other insolvent persons, the latter not getting the same legal relief from their debts. In all civilized communities laws have been passed regarding bankruptcy. At present bankruptcy in England is regulated by the Bankruptcy Acts of 1914 and 1926. They have as one chief feature the intervention of the Board of Trade in administrative matters with the object of obtaining full official supervision and control. A bankruptcy petition may be presented either by a creditor or creditors or by the debtor. A creditor's petition must be founded on a debt of not less than fifty pounds, due to one or more creditors, and on an "act of bankruptcy" committed by the debtor within three months before the presentation of the petition.

A debtor commits an act of bankruptcy if he makes a conveyance of his property to a trustee for the benefit of his creditors; if he makes a fraudulent transfer of any part of his property; if, to defeat or delay his creditors, he conceal himself either at home or abroad; if execution issued against him has been enforced by seizure and sale of his goods under process in an action in any court; if he files in court a declaration of inability to pay his debts, or presents a bankruptcy petition against himself; if a creditor has obtained a final judgment against him for any amount and he fails to comply with a bankruptcy notice to pay the judgment debt without satisfactory reason; or if the debtor gives notice to any of his creditors that he has suspended, or is about to suspend, payment of his debts.

In London jurisdiction in bankruptcy now rests with the High Court of Justice, while the county courts outside the London district continue to have jurisdiction in bankruptcy. When the court is satisfied as to the petition, a "receiving order" is issued to protect the debtor's estate by constituting an official appointed by the Board of Trade receiver of the debtor's property, and staying the remedies of all creditors until the meeting of creditors. The debtor must make out a full statement of his affairs, showing his liabilities and assets. The official receiver summons the meeting of creditors, a summary of the debtor's affairs being sent to each creditor with the notice of the meeting, which also is advertised in the *London Gazette*. The creditors

must send to the official receiver, before the meeting, sworn proofs of their claims to enable them to vote.

At the meeting the creditors (unless the debtor's proposal for a composition or scheme be entertained) may pass a resolution adjudging the debtor bankrupt, and appoint a trustee of the bankrupt's property, with a committee of inspection selected from their own body to superintend the administration of the bankrupt's property by the trustee, who divides the available realized assets amongst all creditors who have sent sworn proofs of claims. Priority in payment is given to rates and taxes, the wages or salary (including commission) of any clerk or servant to the extent of £50 earned in the four months before the date of the receiving order, and to the wages of any labourer or workman up to £25 earned during the two months before the same date. The trustee is required to give satisfactory security to the Board of Trade, and his accounts are audited not less than twice in each year. All moneys received by the trustee under the bankruptcy must as a rule be paid forthwith to an account kept at the Bank of England by the Board of Trade, called the "Bankruptcy Estates Account."

The debtor is bound to be publicly examined upon oath in court, and any creditor who has tendered a proof, or his representative, may take part in the examination. Until the debtor's public examination is concluded he cannot apply for an order of discharge, and upon proof of misdemeanour the court refuses or suspends the discharge. A discharged bankrupt is disqualified for five years from *inter alia* acting as member of Parliament, justice of peace, alderman, overseer of the poor, county councillor, or as a member of any highway, or burial board. An undischarged bankrupt obtaining credit to the extent of £10 or upwards from any person, without informing such person of his status, is guilty of a misdemeanour.

By the Act of 1914 the debtor may lodge with the official receiver proposal for a composition or scheme of arrangement of his affairs, but the composition or scheme shall not be binding on the creditors, unless accepted at a meeting by a majority in number representing three-fourths in value of all the creditors who have proved. The composition or scheme has then to be formally brought before the court for approval, which may be refused. A composition or scheme may be sanctioned by the court after the debtor's adjudication as a bankrupt, and in this case the bankruptcy is annulled. The estates of persons dying insolvent may be administered according to the bankruptcy law. Though imprisonment for debt has been abolished, fraudulent bankrupts may be punished, and the conduct of prosecutions for offences arising out of any bankruptcy proceeding falls to the Public Prosecutor.

Various offences, such as failure to make full discovery of his property, failure to deliver up property or books, concealment of property or debts, making a material omission in any statement relating to his affairs, are misdemeanours and may be tried before a stipendiary magistrate or justices of the peace as well as by indictment. The onus of proving that he had no intention to defraud lies upon the bankrupt. Failure on the part of a bankrupt to keep proper accounts is also an offence, but until the 16th June, 1928, only in the case of a bankrupt who has previously been made bankrupt.

**Scots Law.** In Scots law "bankruptcy" means either insolvency or notour bankruptcy or the result of sequestration. Insolvency means either an excess of debt over assets or present inability to make a payment due and demanded. A gift by one insolvent in the first sense to a conjunct or confident person, that is, a relative or business associate, is voidable at common law or under the Act 1621, c. 18; securities for prior debts granted by one knowing himself to be insolvent are reducible at common law. Notour bankruptcy is constituted by sequestration; or by insolvency concurring with the use against the debtor's property of a legal method of effecting payment. Under the Act 1696, cap. 5, "securities" for prior debts given within sixty days of notour bankruptcy are reducible, but cash payments and transactions in ordinary course of business are not affected. All diligences, e.g. arrestments (q.v.), used with sixty days before and four months after notour bankruptcy rank *pari passu*. Sequestration is the process by which the estates of a debtor, whether alive or dead, are vested in a trustee for behoof of the creditors. A petition for sequestration may be presented by the debtor with concurrence of one or more creditors whose debts in all amount to £50, or by one or more creditors so qualified, if the debtor be notour bankrupt and has within the preceding year resided or had a dwelling-house or place of business in Scotland.

Proceedings may be in either the Court of Session or the Sheriff Court. After sequestration is awarded by the

Court the creditors elect a trustee and three creditors as commissioners to advise him. The order of Court confirming the election of the trustee is called the Act and Warrant, and it vests in the trustee for behoof of the creditors as at the date of sequestration, the whole property of the debtor and property he may acquire before his discharge. The bankrupt must deliver a true state of his affairs and submit himself to examination: creditors lodge their claims, which they must be prepared to prove, valuing and deducting any security they hold. The trustee decides on the validity of claims and an appeal lies to the Court. The trustee divides the assets amongst the creditors whose claims are admitted.

A bankrupt may be discharged on composition, that is, an offer to pay a dividend accepted by a majority of the creditors and approved by the Court. Discharge without composition may be obtained on a favourable report by the trustee within two years of sequestration with concurrence of a majority of creditors, and after two years without such concurrence, provided the bankrupt has paid five shillings in the pound, or that failure to do so is not due to his fault. Discharge frees the bankrupt from all debts except debts due to the Crown and debts incurred after sequestration. On discharge without composition the bankrupt is not reinvested in his estate and any further asset recovered is available to the creditors.

In Ireland there is a special code of bankruptcy contained in special Acts, differing to some extent from the regulations prevailing both in England and Scotland. It is believed that the Government of the Free State at present contemplate further legislation on this subject.

Official returns in Great Britain show a tendency towards a smaller number of failures, but a larger amount of money is involved.

In the different British colonies the laws regulating bankruptcy naturally differ, and the same is the case with the individual States of the American Union, though Congress has the power of legislation for the whole country in regard to this, and has oftener than once done so.—BIBLIOGRAPHY: H. Goudy, *Treatise of the Law of Bankruptcy in Scotland*; Sir R. H. J. Palgrave, *Dictionary of Political Economy*; E. T. Baldwin, *The Law of Bankruptcy and Bills of Sale*; Sir R. L. V. Williams, *The Law and Practice of Bankruptcy*; R. Ringwood, *The Principles of Bankruptcy*.

**BANKS, Sir Joseph.** Baronet, a distinguished naturalist, born in London 1743. After studying at Harrow and Eton he went to Oxford in 1760, and formed there amongst his fellow-undergraduates a voluntary class in botany, etc. He was elected Fellow of the Royal Society in 1766, and soon after went to Newfoundland and Hudson's Bay to collect plants. In 1768, with Dr. Solander, a Swedish gentleman, pupil of Linnæus and then assistant librarian at the British Museum, he accompanied Cook's expedition as naturalist. In 1772 he visited Iceland along with Dr. Solander, and during this voyage the Hebrides were examined, and the columnar formation of the rocks of Staffa first made known to geologists. In 1777 Banks was chosen President of the Royal Society, and in 1781 was made a baronet, and in 1795 received the Order of the Bath. He wrote only essays, papers for learned societies, and short treatises. He died in 1820, and bequeathed his collections to the British Museum.

**BANKS, Thomas.** An English sculptor, born in 1735, died in 1805. He studied sculpture in the Royal Academy, where he obtained the gold medal for a bas-relief of the *Rape of Proserpine*. In 1772 he went to Italy, where he executed several excellent pieces, particularly *Cupid tormenting a Butterfly*, which was afterwards purchased by the Empress Catherine. On leaving Italy he spent two unsatisfactory years in Russia, and then returned to England, where he was soon after made an Academician. One of his best-known works is *Shakespeare attended by Painting and Poetry*. Among his other works was a colossal statue—*Achilles mourning the loss of Briseis*—in the hall of the British Institution, and the monument of Sir Eyre Coote in Westminster Abbey. His bust of Warren Hastings is in the National Gallery.

**BANK'SIA** (named after Sir Joseph Banks). A genus of Australian shrubs and trees, order Proteaceæ, with leathery leaves generally dark-green on the upper surface and pale below, often cultivated in conservatories for their peculiar foliage and flowers. They are named "honey-suckles" by the colonists, from the honey the flowers contain.

**BANKS'RING.** *See* BANXRING.

**BANKURA'.** A town of Bengal, on the Dhalkisor River, healthy and with a considerable trade. Pop. 25,000.

**BANN, Upper and Lower.** Two rivers in the N. of Ireland, the former rising in the mountains of Mourne, County Down, and, after flowing 38 miles in a northerly direction, falling into Lough Neagh, the latter being

the outlet of Lough Neagh, and falling into the Atlantic Ocean 4 miles below Coleraine, after a course of nearly 40 miles.

**BAN'NATYNE CLUB.** A literary society instituted in Edinburgh (1823) by Sir Walter Scott (its first president), David Laing (secretary till its dissolution in 1861), Archibald Constable, and Thomas Thomson. It started with thirty-one members, subsequently extended to 100, having as its object the printing of rare works on Scottish history, literature, geography, etc. It derived its name from George Bannatyne (1545-1609), the collector of the famous MS. of early Scottish poetry.

**BANNER.** Name for a flag, especially that carried on festive occasions. In mediæval times it was the flag bearing the coat of arms of a noble, which was carried before him and his followers when they were summoned to join the royal forces.

**BAN'NERET.** Formerly, in England, a knight made on the field of battle as a reward for bravery, with the ceremony of cutting off the point of his pennon and making it a banner. The first banneret in England was made by King Edward I., and the last (John Smith) by Charles I. after the battle of Edgehill in 1642.

**BAN'NOCK.** A cake made of oatmeal, barley-meal, or peasemeal baked on an iron plate or griddle over the fire. From a supposed resemblance the turbot is sometimes called in Scotland the *Bannock-fluke*.

**BANNOCKBURN.** A village of Scotland, in Stirlingshire, 2 miles S.E. Stirling, famous for the decisive battle in which King Robert Bruce of Scotland defeated Edward II. of England, on the 24th June, 1314. It has manufactures of woollens, such as tartans, carpets, etc.; pop. 4103.

**BANNS OF MARRIAGE.** Public notice of the intended celebration of a marriage given either by proclamation, viva voce, by a clergyman, session-clerk, or precentor in some religious assembly, or by posting up written notice in some public place. Dissent of parents or guardians renders null and void the publication of the banns of minors. In France the banns must be published on two distinct Sundays, and the marriage cannot take place until three days after the second publication. In America the practice is confined to the Roman Catholics, although it is still recognised in the statues of some of the States.

**BANNU.** A district in the north, west of India, traversed by the Indus' area, 3847 sq. miles; pop. 390,000, nearly half being Afghans.

Plan of Bannockburn

**BANQUETTE** (bang-ket'). In fortification, the elevation of earth behind a parapet, on which the garrison or defenders may stand. The height of the parapet above the banquette is usually about 4 feet 6 inches; the breadth of the banquette from 2½ or 3 feet to 4 or 6 feet, according to the number of ranks to occupy it. It is frequently made double, that is, a second is made still lower.

**BANSHEE'**, or **BENSHI'**. A fairy woman believed in Ireland and some parts of Scotland to attach herself to a particular house, and to appear or make her presence known by wailing before the death of one of the family.

**BAN'TAM.** A residency occupying the whole of the W. end of the Island of Java. It formed an independent kingdom, governed by its own sultan, till 1683, and the Dutch exercised

suzerainty with brief intermission until its formal incorporation by them at the beginning of last century. It produces rice, coffee, sugar, cinnamon, etc. Serang is its capital. The town Bantam was the first Dutch settlement in Java (1595), and for some time their principal mart, though now not so prosperous.

**BAN'TAM FOWL.** A small but spirited breed of domestic fowl, first brought from the East Indies, supposed to derive its name from Bantam in Java. Most of the subvarieties have feathered legs; but these are not to be preferred. In point of colour the black and nankeen varieties are the best. A well-bred bantam does not weigh more than a pound.

**BANTENG'** (*Bos Banteng* or *Sondaicus*). A wild species of ox, native of Java and Borneo, having a black body, slender white legs, short sleek hair, sharp muzzle, and the back humped behind the neck.

**BANTING SYSTEM.** A course of diet for reducing superfluous fat, adopted and recommended in 1863 by W. Banting of London. The dietary recommended was the use of butcher-meat principally, and abstinence from beer, farinaceous food, and vegetables. *See* CORPULENCE.

**BAN'TRY.** A seaport near the head of Bantry Bay, County Cork, Irish Free State. Pop. (1926), 2681.—The *bay*, one of three large inlets at the S.W. extremity of Ireland, affords an unsurpassed anchorage, and is about 25 miles long by 4 to 6 broad, and from 10 to 40 fathoms deep, with no dangerous rocks or shoals.

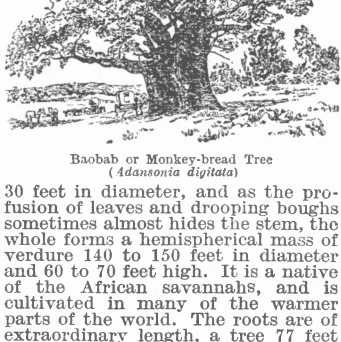
**BANTU** (bän-tö'). The ethnological name of a group of African races below about 6° N. latitude, and including the Kaffirs, Zulus, Bechuanas, the tribes of the Loango, Congo, etc., but not the Hottentots.—BIBLIOGRAPHY: Deniker, *Races of Man*; J. Roscoe, *The Northern Bantu*.

**BANU.** *See* BANNU.

**BANX'RING** (genus Tapaia). A quadruped belonging to the Insectivora, inhabiting the Indian Archipelago, bearing some resemblance externally to a squirrel, but having a long pointed snout.

**BAN'YAN** (*Ficus benghalensis*). A tree of India, of the fig genus. The most peculiar feature of this tree is its method of throwing out from the horizontal branches supports which take root as soon as they reach the ground, enlarge into trunks, and, extending branches in their turn, soon cover a prodigious extent of ground. A celebrated banyan tree has been known to shelter 7000 men beneath its shade. The wood is soft and porous, and from its white glutinous juice bird-lime is sometimes prepared. Both juice and bark are regarded by the Hindus as valuable medicines, and the tree itself is sacred. The banyan tree is described by Southey in his poem *The Curse of Kehama*.

**BA'OBAB** (*Adansonia digitāta*), or **MONKEY-BREAD TREE.** A tree belonging to the nat. ord. (or sub-ord.) Bombaceæ, and the best-known species of its genus, which was named after the naturalist Adanson. Though not tall, it is one of the bulkiest of trees, its trunk sometimes measuring



Baobab or Monkey-bread Tree
(*Adansonia digitata*)

30 feet in diameter, and as the profusion of leaves and drooping boughs sometimes almost hides the stem, the whole forms a hemispherical mass of verdure 140 to 150 feet in diameter and 60 to 70 feet high. It is a native of the African savannahs, and is cultivated in many of the warmer parts of the world. The roots are of extraordinary length, a tree 77 feet in girth having a tap-root 110 feet in length. The leaves are deep green, divided into five unequal parts lanceolate in shape, and radiating from a common centre. The flowers resemble the white poppy, having snowy petals and violet-coloured stamens; and the fruit, which is large and of an oblong shape, is said to taste like gingerbread, with a pleasant acid flavour. The wood is pale-coloured, light, and contains a large store of water, which enables the tree to withstand prolonged drought. The tree is liable to be attacked by a fungus which, growing in the woody part, renders it soft and pithlike. By the negroes of the west coast these trunks are hollowed into chambers, and dead bodies are suspended in them. There they become perfectly dry and well preserved, without further preparation or embalming. The baobab is

emollient and mucilaginous; the pulverized leaves constitute *lalo*, which the natives mix with their daily food.

**BAPAUME.** A French town in the department of Pas-de-Calais. It has been the scene of several battles. In 1793 the French were compelled by the allied troops to abandon the place, and in the Franco-German war one of the most closely-contested battles was fought there on 3rd Jan., 1871. Bapaume, occupied by the Germans in the European War, was recaptured by British troops on 29th Aug., 1918, the great battle of Bapaume having begun on 21st Aug. Pop. 4000.

**BAPH'OMET.** The imaginary idol or symbol which the Templars were accused of employing in their mysterious rites, and of which little is known. The word is supposed to be a corruption of Mahomet, to whose faith the Templars were accused of having a leaning. *See* GNOSTICISM.

**BAPTISM** (from the Gr. *baptizō*, from *baptō*, to immerse or dip). A rite which is generally thought to have been usual with the Jews even before Christ, being administered to proselytes. All that can be said, however with some certainty is that the Jewish baptism was not of later origin than the Christian baptism. Anyhow, from this baptism that of St. John the Baptist differed, because he baptized Jews also as a symbol of the necessity of perfect purification from sin. Christ himself never baptized, but directed his disciples to administer this rite to converts (Mat. xxviii. 19); and baptism, therefore, became a religious ceremony among Christians, taking rank as a sacrament with all sects which acknowledge sacraments. It should, however, be borne in mind that among many peoples a rite is found which has considerable likeness to Christian baptism.

**Early Customs.** In the primitive Church the person to be baptized was dipped in a river or in a vessel, with the words which Christ had ordered, generally adopting a new name further to express the change. Sprinkling, or, as it was termed, *clinic* baptism, was used only in the case of the sick who could not leave their beds. The Greek Church and Eastern schismatics retained the custom of immersion; but the Western Church adopted or allowed the mode of baptism by pouring or sprinkling, since continued by most Protestants. This practice can be traced back certainly to the third century, before which its existence is disputed. Since the Reformation there have been various Protestant sects called Baptists, holding that baptism should be admistered only by immersion, and to those who can make a personal profession of faith. The Montanists in Africa baptized even the dead, and in Roman Catholic countries the practice of baptizing church bells—a custom of tenth-century origin—continues to this day. Being an initiatory rite, baptism is only administered once to the same person. The Roman and Greek Catholics consecrate the water of baptism, but Protestants do not. The act of baptism is accompanied only with the formula that the person is baptized in the name of the Father, Son, and Holy Ghost; but, among most Christians, it is preceded by a confession of faith made by the person to be baptized if an adult, and by his parents or sponsors if he be a child.

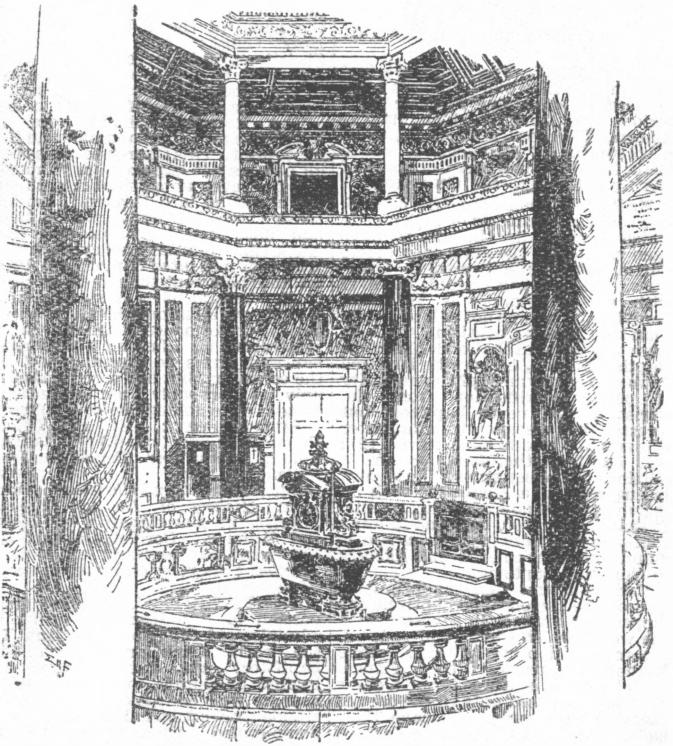
The Roman Catholic form of baptism is far more elaborate than the Protestant. This Church teaches that all persons not baptized are damned, and that even unbaptized infants are not admitted into Heaven; but for those whose chief fault was that they had not been baptized, even St. Augustine himself believed in a species of mitigated damnation. Protestants hold that though the neglect of the sacrament is a sin, yet the saving new birth may be found without the performance of the rite which symbolizes it. Naming the person baptized forms no essential part of the ceremony, but has become almost universal, probably from the ancient custom of renaming the catechumen.

—BIBLIOGRAPHY: E. B. Tylor, *Primitive Culture* (vol. ii.); S. Baring-Gould, *Origin and Development of Religious Belief*; J. E. Hanaver, *Baptism, Jewish and Christian*; Harnack, *History of Dogma*; article *Baptism* in *Encyclopœdia of Ethics and Religion*; Corblet, *Histoire du Sacrément du Baptême*; P. Mauro, *Baptism: its place and importance in Christianity.*

**BAP'TISTERY.** A building or a portion of a building in which is administered the rite of baptism. In the early Christian Church the baptistery was distinct from the basilica or church, but was situated near its west end, and was generally circular or octagonal in form, and dome-roofed. About the end of the sixth century the baptistery began to be absorbed into the church, the font being placed within and not far from the western door. Some detached baptisteries still remain in use, as those of the Lateran, Rome (the earliest in existence), at Pisa, Parma, Ravenna, Aquileia, Siena, Florence, etc., that of Florence being 108 feet in diameter externally, and

richly decorated. Baptisteries were dedicated to St. John the Baptist.

**BAP'TISTS.** A Protestant sect, distinguished by their opinions respecting the mode and subjects of baptism. With regard to the mode, they maintain the necessity of immersion, and with regard to the subjects, they consider that baptism ought not to be administered to children at all, nor to adults in general, but to those only who profess repentance and faith. They are sometimes called *Anti-pædobaptists*, to express their variance from those who defend infant baptism and who are called *Pædobaptists*. Apart from the special sect of that name, Baptists are to be found equally among Calvinists and Arminians, Trinitarians and Unitarians. The Baptists as a whole adopt the Independent or Congregational form of church government, and their ecclesiastical assemblies are held for the purpose of mutual stimulus and intercourse, and not for the general government of the body, or for interference with individual churches. The Particular Baptists of England (so called from believing that Christ died only for the elect), the Baptists of Scotland and Ireland, the Associated Baptists of America, and some of the Seventh-day Baptists, are Calvinistic. The other classes, such as the General Baptists (who believe that Christ died for all), are Arminian, or at least not Calvinistic. Most Baptists profess to be Trinitarians. The Free-will Baptists, the Christian Society, and most of the General Baptists of England admit of open communion; the other bodies decline communion with any Christians but Baptists. The As-



Baptistery of S. Giovanni in Laterano, Rome

sociated or Calvinistic Baptists long ranked in the United States as the most numerous denomination of Christians. The Seventh-day Baptists, or Sabbatarians, observe the seventh day of the week. The Free-will Baptists profess the doctrine of free salvation. The Anabaptists of the Reformation period are not to be confounded with the Baptists, by whom their principles were expressly disclaimed.

The first regular Baptist Church appears to have been formed in the reign of Elizabeth, but we may date their first public acknowledgment as distinct from the Anabaptists from their petition to Parliament in 1620. The year 1633 provides the earliest record of the formation of a Particular Baptist Church in London. In 1689 a Baptist General Assembly, held in London, formulated a confession of thirty-two articles and a catechism. The Baptist Union, formed in 1832, comprehends the greater number of members of the sect in Great Britain and Ireland. In July, 1905, a world-congress of Baptists was held in London, and the Baptist World Alliance was constituted. The total number of members of Baptist Churches in the United Kingdom was 414,000 in 1926, and 408,029 in 1920. There are nine colleges for training ministers, of which the chief are Bristol Baptist College; Regent's Park; Rawdon, Bradford; and the Metropolitan Pastors' College. The Regular Baptists in the United States numbered 8,397,914 members in 1927, and nearly 6,000,000 in 1920, in addition to which there are Anti-mission Baptists, Free-will Baptists, and Seventh-day Baptists. In Canada there are in all about 421,731 Baptists.—BIBLIOGRAPHY: H. C. Vedder, *A Short History of the Baptists*; A. H. Newman, *History of the Baptist Churches in the United States*; *The Baptist Handbook* (annually); *The American Baptist Year-book* (annually); W. E. MacIntyre, *Baptist Churches*, 1500-1914.

**BAR.** In law, the railing that encloses the place which counsel occupy in courts of justice; hence the phrase, *at the bar of the court*, that is, in open court. Hence also persons duly admitted as pleaders or advocates before the courts of England are denominated *barristers* (*see* BARRISTER), and the whole body of such barristers or advocates are called the *bar*. The enclosed place or dock in which persons accused of crimes stand in court is also called the bar. Near the door of both Houses of Parliament there is also a bar, beyond which none but the members and clerks are admitted, and at which counsel, witnesses, offenders against privilege, etc., are heard.

**BAR.** In music, is a line drawn through the stave to mark the rhythm of small portions; the notes composing these are also called a bar.

**BAR.** In heraldry, an ordinary resembling the fesse, stretching like it horizontally across the shield but narrower.

**BAR, Confederation of.** *See* POLAND.

**BAR'ABA.** The name of a great steppe in the West Siberian governments of Tomsk, Akmolinsk, and Tobolsk.

**BARABIN'ZIANS.** A rude, uncultivated tribe of Tartars, living on the banks of the River Irtish, and subsisting chiefly on the produce of their herds and on fish supplied by the lakes of the Baraba steppe.

**BARAGUEY-d'HILLIERS** (bà-râ-gā-dēl-yā), **Louis.** A distinguished French general under the first Empire, born in Paris, 1764. After serving under Custine and other generals he joined the army of Italy, and took Bergamo and Venice, of which he became Governor. He took part in the expedition to Egypt, served in the campaigns in Germany and Spain, and commanded a division of the "Great Army" in the Russian campaign of 1812. He was entrusted with the direction of the vanguard in the retreat, but was compelled to capitulate. Napoleon ordered him to return to France as under arrest, but, overcome with grief and fatigue, he died at Berlin on the way, Dec., 1812.

**BARANOVITCHI.** A town in Russia, government of Minsk. A battle was fought here between the Russians and the Germans in July, 1916. *See* EUROPEAN WAR.

**BARB.** A horse of the Barbary breed, introduced by the Moors into Spain, and of great speed, endurance, and docility.

**BAR'BACAN,** or **BARBICAN.** Generally an advanced work defending the entrance to a castle or fortified town, as before the gate or drawbridge, and often of formidable size and strength.

**BARBA'DOS,** or **BARBADOES.** The most eastern of the West India Islands, first mentioned in 1518, and occupied by the British in 1625. Length, 21 miles; breadth, 13; area, 106,470 acres or 166 sq. miles, about 74,000 being under cultivation. It is divided into eleven Church of England parishes; capital, Bridgetown. It is one of the most densely-populated areas in the world, the population in 1926 being estimated at

Barbacan: Walmgate Bar, York

169,385, or over 1000 to the square mile. The climate is very hot, though moderated by the constant trade-winds; and the island is subject to dreadful hurricanes. The surface is broken, now without forests, and with few streams; the highest point is 1145 feet above the sea-level. There are few indigenous mammals or birds. The black lowland soil gives great returns of sugar in favourable seasons. The chief exports, besides sugar, are molasses and rum; imports: rice, salt meat, corn, butter, flour, etc. In 1927 exports were valued at £1,287,161, imports at £2,155,167. Barbados has a considerable transit trade, being in some measure the central mart for all the Windward Islands. It is the see of a bishop and the headquarters of the British forces in the West Indies. There is a railway across the island, also tramways, telephones, etc. The island forms a distinct government under a Governor, an Executive and a Legislative Council of 9 members, and a House of Assembly of 24 members. Liberal provision is made for education both by old foundations and by annual vote.

**BARBADOES LEG.** A form of elephantiasis.

**BAR'BARA, St.** According to the legend, belonged to Nicomedia, in Asia Minor, and was beheaded by her father for having turned Christian, he being immediately thereafter struck dead by lightning. The latter part of this legend caused her, probably, to be invoked in storms, and to be considered the patron saint of artillerists.

**BARBARELLI.** *See* GIORGIONE.

**BARBARIAN** (Gk. *barbaros*). A name given by the Greeks, and afterwards by the Romans, to every one who spoke an unintelligible language; and hence coming to connote the idea of *rude, illiterate, uncivilized.* This word, therefore, did not always convey the idea of something odious or savage; thus a Greek character in Plautus calls Nævius a barbarous poet, because he had not written in Greek; and Cicero terms illiterate persons without taste "barbarians."

**BARBAROSSA** ("red-beard"). The name of two famous Turkish corsairs of the sixteenth century, who ravaged the shores of the Mediterranean, and established themselves in Algiers. The elder of the brothers, Aruch or Horuk, was killed in 1518; the younger and more notorious, Hayraddin, who captured Tunis, died in 1546. *See* FREDERICK BARBAROSSA.

**BAR'BARY.** A general name for the most northerly portion of Africa, extending about 2600 miles from Egypt to the Atlantic, with a breadth varying from about 140 to 550 miles, comprising Morocco, Algeria, Tunisia, and Libya (Tripolitania, Barqa, and Fezzan). The principal races are: the Berbers, the original inhabitants, from whom the country takes its name; the Arabs, who conquered an extensive portion of it during the times of the caliphs; the Bedouins, Jews, Turks, and the French colonists of Algeria, etc. The country, which was prosperous under the Carthaginians, was, next to Egypt, the richest of the Roman provinces, and the Italian States enriched themselves by their intercourse with it. In the fifteenth century, however, it became infested with adventurers who made the name of Barbary corsair a terror to commerce, a condition of things finally removed by the French occupation of Algeria.

**BARBARY APE** (*Inŭus ecaudātus*). A species of ape, or tailless monkey, with greenish-brown hair, of the size of a large cat, remarkable for docility, also called the *magot*. It is common in Barbary and other parts of Africa, and some used to live formerly on Gibraltar Rock, being the only European monkey, though probably not indigenous. It has been the "showman's ape" from time immemorial.

**BAR'BASTEL,** or **BARBASTELLE.** A bat with hairy lips (*Barbastellus commānis*), a native of England.

**BARBAS'TRO.** A city, Spain, Arragon, province of Huesca, with an interesting cathedral, and some trade and manufactures. Pop. 7202.

**BAR'BAULD, Anna Letitia.** English poet and general writer, was born in Leicestershire, 1743, daughter of a Presbyterian minister named Aikin. She published a small volume of miscellaneous poems in 1772, and in 1773, in conjunction with her brother, Dr. John Aikin, a collection of pieces in prose. In 1774 she married the Rev. Rochemont Barbauld. Her *Early Lessons and Hymns for Children*, and various essays and poems, won considerable popularity. She edited a collection of English novels, with critical and biographical notices; a selection from the British essayists of the reign of Anne, and another from Richardson's correspondence. Her last long poem, *Eighteen Hundred and Eleven*, appeared in 1812. She died at Stoke-Newington, 1825.

**BAR'BECUE.** A word of West Indian origin, meaning a hog, or other large animal, roasted whole. In the United States the word means a large gathering of people in the open air, for a social or political feast, where whole animals are roasted and eaten.

**BARBED WIRE.** Wire-rope for fencing or other purposes, having fixed in it short, bent pieces of wire with sharp projecting points, which serve to keep animals from pressing against it. There is an Act of Parliament (1893) to prevent the use of barbed-wire fences that form a nuisance on a public road or path; and a person employing barbed wire for fencing may render himself liable for damages caused by it to another person who is legitimately using the adjoining ground. Barbed wire plays an important part in the construction of obstacles in modern warfare. During the European War, all systems of trenches were protected by thick belts of wire. This wire was laid out in various different ways, two of the best being known as the Concertina Fence and the Double-apron Fence.

**BARBEL** (Barbus). A genus of freshwater fishes of the carp family distinguished by the four fleshy filaments growing from the lips, two at the nose and one at each corner of the mouth, forming the kind of beard to which the genus owes its name. Of the several species the European *Barbus vulgāris*, common in most rivers, has an average length of from 12 to 18 inches, and in form and habits strongly resembles the pike. Its body is elongated and rounded, olive-coloured above and bluish on the sides, and covered with small scales. The upper jaw, which is much longer than the lower, forms a snout, with which it bores into the mud for worms, insects, aquatic plants, etc. It is common in the Thames, where it gives good sport to the angler; but its flesh is very coarse, and at the time of spawning the roe is dangerous to eat.

**BARBER.** One whose occupation is to shave or trim the beard, or to cut and dress hair. The practice of surgery was formerly a part of the craft, and by an Act of Henry VIII. the Company of Barbers was incorporated with the Company of Surgeons—the company being then known as the Barber-surgeons—with the limitation, however, that the

surgeons were not to shave or practise "barbery," and the barbers were to perform no higher surgical operation than blood-letting and tooth-drawing. This continued till the time of George II. The signs of the old profession—the pole which the patient grasped, its spiral decoration in imitation of the bandage, and the basin to catch the blood—are still sometimes retained. The barbers' shops, always notorious for gossip, were in some measure the news centres of classic and mediæval times. The ancient hall in London, formerly used by the Barber-surgeons is still standing in Markwell Street, Cripplegate.

**BARBERINI** (bär-be-rē'nē). A celebrated Florentine family, which, since the pontificate of Maffeo Barberini (Urban VIII., 1623-44), has occupied a distinguished place among the nobility of Rome. During his reign Urban was chiefly intent on the aggrandizement of his three nephews, of whom two were appointed cardinals and the third Prince of Palestrina.

**BAR'BERRY.** A genus of shrubs, nat. ord. Berberidaceæ. The common barberry (*Berberis vulgaris*) has serrate, pointed leaves (the primary

Barberry (*Berberis aristata*)

ones reduced to tripartite spines), hanging clusters of yellow flowers, and small, orange-red berries, which are sometimes made into preserves. The inner bark and roots yield a fine yellow dye (berberine). The shrub is a native of temperate Asia, but is now generally diffused through Europe and N. America. In Britain it has been almost universally banished from hedgerows, owing to its connection with the black rust of wheat. Numerous other species inhabit Asia and America; those of the section Mahonia have pinnate leaves. *B. aristata* is an erect bush, with furrowed red-brown branches, and pendulous clusters of yellow flowers; it thrives best in the south. *See* IRRITABILITY and RUST.

**BAR'BERTON.** The chief mining-centre of De Kaap gold-fields, Transvaal, about 80 miles from Lydenburg, and 150 to 160 from Delagoa Bay. British prisoners were confined here in the Boer War (1899-1902). Pop. about 2000 (whites).

**BAR'BETS** (Bucconidæ). A family of climbing birds with a thick conical beak, having tufts of bristles at its base. Their wings are short and their flight somewhat heavy. They have been divided into three sub-genera: The *barbicans* (Pogonias), inhabiting India and Africa, and feeding chiefly on fruit; the *barbets* proper (Bucco), found in Africa and America, and nearly related to the woodpeckers; and the *puff-birds* (Tamatia), inhabiting America, and feeding on insects.

**BARBETTE** (bär-bet'). An elevation of earth behind the breastwork of a fortification, from which the artillery may be fired over the parapet instead of through an embrasure. In ships of war the name is given to a strong breastwork of armour over which heavy guns are fired. *See* FORTIFICATION.

**BARBEYRAC** (bär-bā-rāk), **Jean.** An able writer on jurisprudence and natural law, translator of Grotius and Cumberland, and translator and annotator of Pufendorf. Born 1674; professor of law at Lausanne and Groningen; died 1744.

**BARBICAN.** *See* BARBACAN.

**BARBIÉ DU BOCAGE** (bärb-yā dü bō-käzh), **Jean Denis.** A distinguished geographer, born in Paris in 1760, who laid the foundation of his fame in 1788 by his *Atlas* to Barthélemy's *Voyage du Jeune Anacharsis.* His maps and plans to the works of Thucydides, Xenophon, etc., exhibit much erudition, and materially advanced the science of ancient geography. He also prepared many modern maps, and published various excellent dissertations. He held many honourable posts, and died in 1825.

**BARBIER** (bärb-yā), **Antoine Alexandre.** Bibliographer (1765-1825). He was appointed keeper of the library of the Conseil d'État in 1798; Napoleon made him his librarian in 1807; and he was afterwards librarian to Louis XVIII. His *Catalogue de la Bibliothèque du Conseil d'État* (1801-3), and *Dictionnaire des Ouvrages Anonymes et Pseudonymes* (1806 9), are both valuable works.

**BARBIERI** (bär-bē-ā'rē), **Giovanni Francesco** (otherwise known as *Guercino* (the squinter) *da Cento*). An

eminent and prolific historical painter, born near Bologna 1590, died in 1666. His style showed the influence of Caravaggio and of the Caracci, his best work being of the latter school. Chief work, a *St. Petronilla* in the Capitol at Rome; but most of the large galleries have pictures by him.

**BARBIERI, Paolo Antonio.** A celebrated still-life and animal painter, was a brother of Guercino; born 1596, died 1640.

**BARBIZONE.** *See* VERONAL.

**BARBIZON** (bȧr-bē-zōn). A French village about 25 miles south by east of Paris, on the borders of the Forest of Fontainebleau, and 6 miles north-west of the town of that name. It has given its name to a French school of painters, including Corot, Millet, Rousseau, Jules Dupré, and Daubigny.

**BAR'BOUR, John.** An ancient Scottish poet, contemporary with Chaucer, born about 1316. By 1357 he was Archdeacon of Aberdeen, and in the following year was appointed a commissioner to treat for the ransom of David II. He appears as Auditor of the Exchequer more than once; he travelled through England on several occasions, and was pensioned by Robert II. His chief poem, *The Bruce* (Brus), written about 1375, was first published in 1571, and the chief manuscripts of the poem are those in the Advocates' Library, Edinburgh, dated 1489, and in St. John's College, Cambridge. Of another long poem, setting forth the Trojan origin of the Scottish kings, no MS. remains, unless a portion of two Troy books in the Cambridge and Bodleian libraries may be ascribed to Barbour. He has also been credited with having compiled a *Book of Legends of Saints*, existing in a single MS. at Cambridge, and published in 1881-2 by Horstman in his *Legenden Sammlung*. He died in 1395. He was the father of Scottish poetry and history, and his *Bruce* is linguistically of high value. Though wanting in the higher qualities of poetry, it is truthful and natural, and often exhibits a high moral dignity.—BIBLIOGRAPHY: Andrew Lang, *History of Scotland*; Irving, *History of Scottish Poetry*.

**BARBUDA** (bȧr-bū'da). One of the West Indies, annexed by Britain in 1628; about 15 miles long and 8 miles wide; lying north of Antigua; pop. 580. It is flat, fertile, and healthy. Corn, cotton, pepper, and tobacco are the principal produce, but the island is only partially cleared for cultivation. There is no harbour, but a well-sheltered roadstead on the west side. It is a dependency of Antigua.

**BARBUSSE, Henri.** A French author born at Asnières in 1874. He served in the French army during the European War, and his descriptions of the realities of modern warfare have made him famous. His works include *Le Feu* and *Clarté*.

**BARBY** (bär'bē). A German town on the Elbe, in the government of Magdeburg, with an old castle. Pop. 5202.

**BAR'CA.** A division of N. Africa, between the Gulf of Sidra and Egypt, annexed by Italy in 1911-2; capital, Benghazi. It formed a portion of the ancient Cyrenaica, and from the time of the Ptolemies was known as Pentapolis from its five Greek cities. It became part of Tripoli, and later a separate province under Turkish dominion. On 18th Oct., 1912, it was formally recognized as a dependency of Italy, and forms with Tripoli the Italian colony of Libya. The country consists of a rocky plateau. A large portion of it is desert, but some parts, especially near the coast, are fertile, and yield abundant crops and excellent pasture, the chief being wheat, barley, dates, figs, and olives. Flowering shrubs, roses, honeysuckles, etc., occur in great variety. There are hardly any permanent streams, but the eastern portion is tolerably well watered by rains and springs. The exports are grain and cattle, with ostrich feathers and ivory from the interior. Next to Benghazi (pop. 35,000), the seaport of Derna is the chief town (pop. 8000). The population probably does not exceed 400,000. *See* CYRENAICA and TRIPOLI.

**BARCAROLLE** (-rol'). A species of song sung by the *barcaruoli*, or gondoliers, of Venice, and hence applied to a song or melody composed in imitation. A very well-known example is to be found in Offenbach's *Tales of Hoffmann*.

**BARCELLONA** (bȧr-chel-ō'nȧ). Seaport, Sicily, province of Messina, immediately contiguous to Pozzo di Gotto, and practically forming one town with it. Joint pop. 26,172.

**BARCELONA** (bȧr-thel-ō'nȧ). Next to Madrid the chief city of Spain, capital of the province of Barcelona, and formerly capital of the kingdom of Catalonia; finely situated on the northern portion of the Spanish Mediterranean coast. It is divided into the upper and lower town; the former modern, regular, stone-built, and often of an English architectural type, the latter old, irregular, brick-built, and with traces of Eastern influence in the architecture. The harbour is suited to accommodate large vessels.

**Manufactures.** The principal manu-

factures are cottons, silks, woollens, machinery, paper, glass, chemicals, stoneware, soap; exports manufactured goods, wine and brandy, fruit, oil, etc.; imports coals, textile fabrics, machinery, cotton, fish, hides, silks, timber, etc. The city contains a university, several public libraries, a museum, a large arsenal, cannon-foundry, etc. Barcelona was, until the twelfth century, governed by its own counts, but was afterwards united with Aragon. In 1640, with the rest of Catalonia, it placed itself under the French Crown; in 1652 it submitted again to the Spanish Government; in 1697 it was taken by the French, but was restored to Spain at the Peace of Ryswick. It has had several severe visitations of cholera and yellow fever, and has been the scene of many serious and sanguinary revolts, as in 1836, 1840, and 1909. Pop. 782,000. —The province has an area of 2968 sq. miles; pop. 1,415,155 (1926). It is generally mountainous, but well cultivated, and among the most thickly peopled in Spain.

**BARCELONA.** A town of Venezuela, near the mouth of the Neveri, which is navigable for vessels of small size, but larger vessels anchor off the mouth of the river. Pop. 13,000.

**BARCELONA NUTS.** Hazel-nuts exported from the Barcelona district of Spain.

**BAR'CLAY, Alexander.** A poet of the sixteenth century, most probably a native of Scotland, born about 1475; for some years a priest and chaplain of St. Mary Ottery, in Devonshire; afterwards a Benedictine monk of Ely; subsequently a Franciscan, and also the holder of one or two livings; died 1552. His principal work was a satire, entitled *The Shyp of Folys of this Worlde*, part translation and part imitation of Brandt's *Narrenschiff* (Ship of Fools), and printed by Pynson in 1509. He also wrote *The Myrrour of Good Maners*, and some *Egloges* (Eclogues), both printed by Pynson, as well as translations, etc.

**BARCLAY, John.** Poet and satirist, son of a Scottish father, born at Pont-à-Mousson (Lorraine) in 1582, and probably educated in the Jesuits' College there. Having settled in England, he published a Latin politico-satirical romance, entitled *Euphormionis Satyricon*, having as its object the exposure of the Jesuits. In 1616 he left England for Rome, received a pension from Pope Paul V., and died in 1621. His chief work is a singular romance in Latin, entitled *Argenis* (Paris, 1621), thought by some to be an allegory bearing on the political state of Europe at the period. Several seventeenth-century romances were indebted to this work, among others Fénelon's *Télémaque* and Calderon's *Argenis y Poliarco*. It has been translated into several modern languages. His shorter poems appeared in the *Delitiæ Poetarum Scotorum*.

**BARCLAY, Robert.** The celebrated apologist of the Quakers, born in 1648 at Gordonstown, Moray, and educated at Paris, where he became a Roman Catholic. He was recalled home by his father, whose example he followed in becoming a Quaker. His first treatise in support of his adopted principles, published at Aberdeen in the year 1670, under the title of *Truth Cleared of Calumnies*, together with his subsequent writings, did much to rectify public sentiment in regard to the Quakers. His chief work, in Latin, *An Apology for the True Christian Divinity*, was soon reprinted at Amsterdam, and quickly translated into German, Dutch, French, and Spanish, and, by the author himself, into English. His fame was now widely diffused; and, in his travels with William Penn and George Fox through England, Holland, and Germany, to spread the opinions of the Quakers, he was received everywhere with the highest respect. The last of his productions, *On the Possibility and Necessity of an Inward and Immediate Revelation*, was not published in England until 1686; from which time Barclay lived quietly with his family. He died, after a short illness, at his own house of Ury, Kincardineshire, in 1690. He was a friend of and had influence with James II.

**BARCLAY, Sir Thomas.** British barrister, born in 1853. Educated at the Universities of London, Paris, Bonn, and Jena, he was sent to Paris in 1876 as correspondent of *The Times*. He has been greatly instrumental in bringing about a better understanding between England and France. He was knighted in 1904, and entered Parliament in 1910. His works include: *Problems of International Practice and Diplomacy*; *The Turco-Italian War and its Problems*; *Law and Usage of War*.

**BARCLAY DE TOLLY, Michael.** Prince, a distinguished general and field-marshal of Russia, born in 1755. His family, of Scottish origin, had been established in Livonia since 1689. He entered the army at an early age, served in various campaigns against the Turks, Swedes, and Poles, and in 1811 was named Minister of War. On the invasion of Napoleon he was transferred to the chief command of the army, and adopted a plan of retreat; his forces did not greatly exceed 100,000 men, but the Court became impatient, and

after the capture of Smolensk by the French he was superseded by Kutusov. Sinking all personal feeling, he asked leave to serve under his successor, commanded the right wing at the battle of the Moskwa, maintained his position, and covered the retreat of the rest of the army. After the battle of Bautzen, in 1813, he was reappointed to the chief command, which he had soon after to resign to Prince Schwarzenberg. He forced the surrender of General Vandamme after the battle of Dresden, took part in the decisive battle of Leipzig, and was made a field-marshal in Paris. In 1815 he received from the emperor the title of prince, and from Louis XVIII. the badge of the Order of Military Merit. He died in 1818.

**BAR-COCHBA** (bâr-ko*h*'bâ), or **BAR-COCHEBAS, Simon.** A Jewish impostor, who pretended to be the Messiah, raised a revolt, and made himself master of Jeusalem about A.D. 132, and of about fifty fortified places. Hadrian sent to Britain for Julius Severus, one of his ablest generals, who gradually regained the different forts and then took and destroyed Jerusalem. Bar-cochba retired to a mountain fortress, and perished in the assault of it by the Romans three years after, about 135.

**BAR'COO.** *See* COOPER'S CREEK.

**BARD.** One of an order among the ancient Celtic tribes, whose occupation was to compose and sing verses in honour of the heroic achievements of princes and brave men, generally to the accompaniment of the harp. Their verses also frequently embodied religious or ethical precepts, genealogies, laws, etc. Their existence and function was known to the Romans two centuries B.C.; but of the Gallic bards only the tradition of their popularity survives. The first Welsh bards of whom anything is extant are Taliesin, Aneurin, and Llywarch, of the sixth century.

A considerable lacuna then occurs in their history until the order was reconstituted in the tenth century by King Howel Dha, and again in the eleventh by Gryffith ap Conan. Edward I. is said to have hanged all the Welsh bards as promoters of sedition. Some modern attempts have been made in Wales to revive bardism, and the Cambrian Society was formed in 1818, for this purpose and for the preservation of the remains of the ancient literature. The revived Eisteddfodau, or bardic festivals, have been so far exceedingly popular. In Ireland there were three classes of bards: those who sang of war, religion, etc., those who chanted the laws, and those who gave genealogies and family histories in verse. They were famous harpists. In the Highlands of Scotland there are considerable remains of compositions supposed to be those of their old bards still preserved.—BIBLIOGRAPHY; E. Jones, *Relics of the Welsh Bards*; Walker, *Memoirs of the Irish Bards*; Dottin, *Manuel de l'Antiquité Celtique*; John Rhys and D. Brynmor-Jones, *The Welsh People*; D. D. Evans, *Ancient Bards of Britain*.

**BARDESA'NES.** A Syrian Gnostic, poet, astrologer, and philosopher, born 154 or 164 at Edessa, died 222. His system started with the statement that from the union of God with matter sprang Christ and a female Holy Ghost, from whom in turn sprang various existences. He propagated his doctrines in Syrian hymns (*Hymn on the Soul*), the first in the language. His son, Harmonius, was also an able hymn-writer. The Bardesanists maintained themselves till the twelfth century, the later adherents having practically adopted Manichæism.

**BARDWAN', or BURDWAN'.** A division of Bengal, upon the Hugli, compromising the six districts of Bardwan, Hugli, Howrah, Midnapur, Bankura, and Birbhum. Area, 13,850 sq. miles; pop. 8,245,000.—The district *Bardwan* has an area of 2697 sq. miles, and a pop. of 1,532,500. Apart from its products, rice, grain, hemp, cotton, indigo, etc., it has a noted coal-field of about 500 sq. miles in area, with an annual output of about half a million tons.—The town of *Bardwan* has a fine palace of the Maharajah and a pop. of 40,022.

**BAREBONE, or BARBONE, Praise-God.** The name of a leather-seller in Fleet Street, London, who obtained a kind of lead in the convention which Cromwell substituted for the Long Parliament, and which was thence nicknamed the Barebone Parliament. After its dissolution he disappeared till 1660, when he presented a petition to Parliament against the restoration of the monarchy. In 1661 he was committed to the Tower for some time, but his subsequent history is unknown.

**BAREFOOTED FRIARS.** *See* MONASTICISM.

**BARÉGE** (ba-rāzh'). A light, open tissue of silk and worsted, or cotton and worsted, for women's dresses, originally manufactured near Barèges. It is now made chiefly at Bagnères-de-Bigorre.

**BARÈGES** (bâ-rāzh). A watering-place, south of France, department Hautes-Pyrénées, about 4000 feet above the sea, celebrated for its

thermal springs, which are frequented for rheumatism, scrofula, etc. The place is hardly inhabited except in the bathing season, June till September.

**BAREGINE** (ba-rāzh'in; from *Barèges*). A gelatinous product of certain algæ growing in sulphuric mineral springs, and imparting to them the colour and odour of flesh-broth.

**BAREILLY** (ba-rā'li). A town of India, in the United Provinces, capital of a district of same name, on a pleasant and elevated site. It has a fort and cantonments, a Government college, and manufactures sword-cutlery, gold and silver lace, perfumery, furniture and upholstery. On the outbreak of the Indian Mutiny the native garrison took possession of the place, but it was retaken by Lord Clyde in May, 1858. Pop. 129,462.—The district has an area of 1595 sq. miles; pop. 1,089,550.

**BAR'ENTS, William.** A Dutch navigator of the end of the sixteenth century, who, on an expedition intended to reach China by the North-East Passage, discovered Novaya Zemlya, the northern part of which is named Barents Land. He wintered there in 1596-7, and died before reaching home.

**BARET'TI, Joseph.** An Italian writer, born at Turin, 1719. In 1748 he came to England, and in 1753 published in English a *Defence of the Poetry of Italy against the Censures of M. Voltaire.* In 1760 he brought out a useful *Italian and English Dictionary.* After an absence of six years, during part of which he edited the *Frusta Letteraria* (Literary Scourge) at Venice, he returned to England, and in 1768 published an *Account of the Manners and Customs of Italy.* Not long after, in defending himself in a street brawl, he stabbed his assailant and was tried for murder at the Old Bailey but acquitted, Johnson, Burke, Goldsmith, Garrick, Reynolds, and Beauclerk giving testimony to his good character. An *English and Spanish Dictionary*, and various other works, followed before his death in 1789.

**BARFLEUR** (bar-fleur). At one time the best port on the coast of Normandy, and the reputed port from which William the Conqueror sailed. It was destroyed in the year 1346 by Edward III. Present pop. 1304.

**BARFRUSH', or BARFURUSH'.** *Same as* BALFROOSH.

**BARGAIN AND SALE.** A legal term denoting the contract by which lands, tenements, etc., are transferred from one person to another. *See* CONVEYANCING.

**BARGE.** A term similar in origin to *barque*, but generally used of a flat-bottomed boat of some kind, whether used for loading and unloading vessels, or as a canal-boat, or as an ornamental boat of state or pleasure.

**BARGE-BOARD** (perhaps a corruption of *verge-board*). In architecture, a board generally pendent from the eaves of gables, so as to conceal

Barge-board or gable-end of Manor House, Bramley, Hants

the rafters, keep out rain, etc. They are sometimes elaborately ornamented. The portion of the roof projecting from the wall at the gable-end, and beneath which the barge-board runs, is termed the *barge-course.*

**BARHAM** (bar'am), **Rev. Richard Harris.** A humorous writer, born in 1788 at Canterbury; educated at St. Paul's School, London, and at Brasenose, Oxford; appointed in succession curate of Ashford, curate of Westwell, rector of Snargate in Romney Marsh, and one of the minor canons of St. Paul's Cathedral. He published two novels, *Baldwin* and *My Cousin Nicholas*, wrote nearly a third of the articles in Gorton's *Biographical Dictionary*, and contributed to *Blackwood's Magazine.* In 1824 he was appointed priest in ordinary of the Chapel Royal, and afterwards rector of St. Mary Magdalene and St. Gregory-by-St.-Paul, London. In 1837, on the starting of *Bentley's Miscellany*, he laid the main foundation of his literary fame by the publication in that periodical of the *Ingoldsby Legends.* He died in 1845.

**BARHEBRÆ'US.** *See* ABULFARAGIUS.

**BARI DELLE PUGLI** (bā'rē). A seaport, S. Italy, on a small promontory of the Adriatic, capital of the province Terra di Bari. It was a place of importance as early as the third century B.C., and has been thrice destroyed and rebuilt. The present town, though poorly built for the most part, has a large Norman castle, a fine cathedral and priory, etc. It manufactures cotton and linen goods,

hats, soap, glass, and liqueurs ; has a trade in wine, grain, almonds, oil, etc., and is now an important seaport. A university was opened here in 1924. Pop. 114,754.—The province has an area of 2048 sq. miles, and is fertile in fruit, wine, oil, etc. ; pop. 970,770.

**BARI.** A negro people of Africa, dwelling on both sides of the White Nile, between lat. 3° 30′ and 6° N. They practise agriculture, cattle-rearing, smithwork, etc. Their country was conquered by Baker for Egypt.

**BARIL'LA.** Is the commercial name for impure sodium carbonate imported from Spain and the Levant. At one time all sodium carbonate required for industrial purposes was prepared from barilla obtained by burning various marine plants (Salsola, Salicornia, and others). Only 25 per cent of the weight of the ash contained soda, and consequently its import was expensive and considerably added to the price of the manufacture of glass and soap. During the Napoleonic wars the price of barilla rose to such a height that Napoleon offered a reward for the discovery of a process for the manufacture of sodium carbonate. A chemist, Leblanc, in 1791 invented a a new process by which sodium carbonate could be obtained from common salt, and this entirely superseded barilla. Plants are still grown in Southern France and Spain to obtain soda and other substances from the ash ; but almost all the sodium carbonate of the present day is manufactured chemically.

**BARING.** The name of a famous English family of bankers and financiers, statesmen and diplomats, from which has arisen the financial house of Baring Brothers & Co., and of which members now hold four peerages, namely, two earldoms—Northbrook and Cromer—and two baronies—Ashburton and Revelstoke. The founder of the house was Francis Baring (1740-1810), whose father was a cloth manufacturer near Exeter, and grandfather pastor of the Lutheran Church at Bremen, the family being thus of German origin. Francis Baring settled in London, obtained a high position in the mercantile and financial world, was long a member of Parliament and a director of the East India Company, and was made a baronet in 1793. Of his sons, one, Alexander, was created Baron Ashburton (in 1835), and rendered important political services in connection with the boundary treaty concluded between Britain and the United States, and known by his title (*see* ASHBURTON, ASHBURTON TREATY).

His son, the second Lord Ashburton (1799-1864), held a position of some note in politics, and his first wife, a daughter of the sixth Earl of Sandwich, was fond of the society of both politicans and literary men, among those who were on friendly terms with her being Carlyle and Thackeray. Sir Francis Baring's eldest son, Thomas, was father of Francis Thornhill Baring, first Lord Northbrook (1796-1866), whose eldest son, Thomas, was created Earl of Northbrook in 1876, and held successively a number of high positions, among them that of Viceroy of India (1872-6) and First Lord of the Admiralty (1880-5). (*See* NORTHBROOK.) Another son of Sir Francis, Henry Baring, was father of Edward Baring, the first Baron Revelstoke (born in 1828, died in 1897), who was long one of the most conspicuous members of the financial world of London, and was raised to the peerage as baron in 1885. He had full management of the great house of Baring Brothers, which under him was long most prosperous, but in 1890 fell into temporary difficulties. Henry Baring was father also of Evelyn Baring, Earl Cromer (q.v.).

**BARING-GOULD** (bā-ring-gōld'), **Sabine.** English clergyman and author, born at Exeter, 1834. Educated at Cambridge, he held several livings in the English Church, and in 1881 became rector of Lew Trenchard, Devon. After publishing several books on theological and miscellaneous subjects, he distinguished himself as a novelist. Among his works are : *Iceland, its Scenes and Sagas* ; *Curious Myths of the Middle Ages* ; *The Origin and Development of Religious Belief* ; *Lives of the Saints* (in 15 vols.) ; *Village Sermons* ; *The Vicar of Morwenstowe* (an account of the Rev. R. S. Hawker) ; *The Mystery of Suffering* ; *History of the Church in Germany* ; *The Tragedy of the Cæsars* ; *Cliff Castles and Cave Dwellings* ; *The Church Revival* ; etc. ; besides the novels *Mehalah, John Herring, Richard Cable, The Gaverocks, Court Royal, The Pennycomequicks*, etc. He died in 1924.

**BARING, Maurice.** English author and diplomat born in London in 1874. After serving in the Diplomatic Service he became a journalist and war correspondent, and was on the staff of the R.F.C. during the Great War.

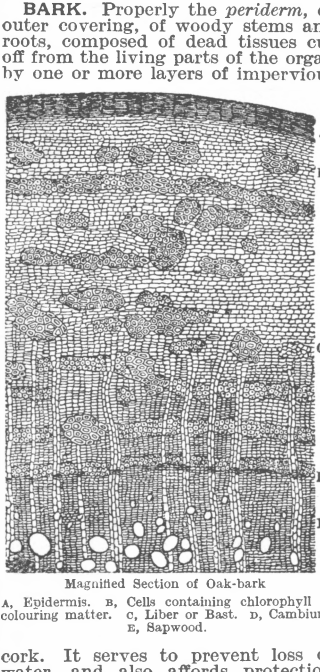
**BARINGO.** A lake in Africa, N.E. of Lake Victoria, about 20 miles long.

**BAR'ITONE,** or **BAR'YTONE.** A male voice, the compass of which partakes of those of the common bass and the tenor, but does not extend so far downwards as the one, nor to an

equal height with the other. Its best tones are from the lower A of the bass clef to the lower F in the treble.

**BA'RIUM** (from the Gr. *barys*, heavy). The metal of which *baryta* is the oxide; specific gravity 4; symbol Ba. It is only found in compounds, such as the common sulphate (or *barytes*) and carbonate, and was isolated by Davy in 1808. It is a yellow malleable metal, which readily oxidizes, decomposes water, and fuses at a low temperature. Its nitrate and chlorate are used in pyrotechny. Barium salts, when brought into a non-luminous flame, burn with a yellowish-green colour. *See* BARYTA.

**BARK.** Properly the *periderm*, or outer covering, of woody stems and roots, composed of dead tissues cut off from the living parts of the organ by one or more layers of impervious




Magnified Section of Oak-bark

A, Epidermis. B, Cells containing chlorophyll or colouring matter. C, Liber or Bast. D, Cambium. E, Sapwood.

cork. It serves to prevent loss of water, and also affords protection against animals and fungi. The outermost bark is continually sloughed in the form of scales (Scots Pine) or sheets (Common Birch), being regenerated from within by the activity of the cork-cambium (*phellogen*). Bark is usually rich in waste-products, many of which are of economic value, such as tannin, gums, etc. Bottle-cork is the bark of the cork-oak. Bark for tanning is obtained from oak, hemlock-spruce, species of acacia, etc. Peruvian and Angostura barks, cinnamon, etc., are other useful barks. As commonly used, bark denotes all the tissues external to the *cambium*.

**BARK, Peruvian.** A valuable bark yielded by species of the genus Rubiaceæ. *See* CINCHONA.

**BARKER, Granville.** Playwright, was born in London in 1877. His principal plays are: *The Voysey Inheritance* (1905), *Waste* (1907), *The Madras House* (1910). He has published a book (in which William Archer collaborated) called *A National Theatre*, and another entitled *The Red Cross in France*. His revivals of Shakespeare have introduced some new ideas of mounting and stage-effects.

**BARKER'S MILL,** also called Scottish turbine. A hydraulic machine on the principle of what is known as the hydraulic tourniquet. This consists of an upright vessel free to rotate about a vertical axis, and having at its lower end two discharging pipes projecting horizontally on either side and bent in opposite directions at the ends, through which the water is discharged horizontally, the direction of discharge being mainly at right angles to a line joining the discharging orifice to the axis. The backward pressures at the bends of the tubes, arising from the two issuing jets of water, cause the apparatus to revolve in an opposite direction to the issuing fluid. The machine was invented by a Dr. Barker towards the end of the seventeenth century.

**BARKING.** A municipal borough, England, Essex, on the Roding, 7 miles N.E. of London, with some important manufacturing works. Near it is the outfall of the sewage of a large part of London. Pop. (1931), 51,277.

**BARKSTON ASH.** A parliamentary division of the West Riding of Yorkshire.

**BARK-STOVE,** or **BARK-BED.** A sort of hothouse for forcing or for growing plants that require a great heat combined with moisture, both of which are supplied by the fermentation that sets up in a bed of spent tanner's bark contained in a brick pit under glass.

**BAR'LAAM AND JOS'APHAT.** A famous mediæval spiritual romance, which is in its main details a Christianized version of the Hindu legends of Buddha. The story first appeared in Greek in the works of Joannes Damascenus in the eighth century. It is, however, more probably, the work of a monk of the Sabbas monastery, near Jerusalem,

and written at the beginning of the seventh century. The compilers of the *Gesta Romanorum*, Boccaccio, Gower, and Shakespeare have all drawn materials from it.—BIBLIOGRAPHY: Max Müller, *Chips from a German Workshop*; J. Jacobs, *Barlaam and Josaphat*. (There is a translation by Rev. G. R. Woodward and H. Mattingly in the Loeb Library).

**BAR-LE-DUC** (bär-l-dük). A town of North-East France, capital of department Meuse, with manufactures of cotton and woollen stuffs, leather, confectionery, etc. Pop. 17,068.

**BARLET'TA.** A seaport in South Italy, province of Bari, on the Adriatic, with a fine Gothic cathedral; it has a considerable export trade in grain, wine, almonds, etc. Pop. 44,233.

**BAR'LEY.** The name of several cereal plants of the genus Hordeum, ord. Gramineæ (grasses), yielding a grain used as food and also for making malt, from which are prepared beer, porter, and whisky. Barley has been known and cultivated from remote antiquity, and beer was made from it among the Egyptians. It is mentioned in Exodus, in connection with the ten plagues; and it is referred to in ancient Chinese records. Excellent barley is produced in Britain. The species principally cultivated are *Hordeum distichum*, two-rowed barley; *H. vulgare*, four-rowed barley; and *H. hexastichum*, six-rowed, of which the small variety is the sacred barley of the ancients. The varieties of the four- and six-rowed species are generally coarser than those of the two-rowed, and adapted for a poorer soil and more exposed situation. Some of these are called *bere* or *bigg*.

In Britain barley occupies more than 22½ per cent of the land under corn, but in N. America the extent of it as a crop is comparatively small, being in Canada, however, relatively greater than in the States, and the Canadian barley is of very high quality. Barley is better adapted for cold climates than any other grain, and some of the coarser varieties are cultivated where no other cereal can be grown. Russia devotes a surface of over 20,000,000 acres to barley, i.e. a little under 11 per cent of the cereal area of the country. Germany has 4,000,000 and France 1,800,000 acres of barley. Some species of the genus, three of which are natives of Britain, are mere grasses. *Pot* or *Scotch barley* is the grain deprived of the husk in a mill. *Pearl barley* is the grain polished and rounded and deprived of husk and pellicle. *Patent barley* is the farina obtained by grinding pearl barley. *Barley-water*, a decoction of pearl barley, is used in medicine as possessing emollient, diluent, and expectorant qualities.

**BARLEYCORN, JOHN.** The name given to the personification of barley when it is used for making malt liquor. It is also used to denote the malt liquor itself, as in Robert Burns's poem, *John Barleycorn*. Barleycorn is also a measure, about one-third of an inch.

**BARLEY-SUGAR.** *See* CONFECTIONERY; SUGAR.

**BAR'LOW, Joel** An American poet and diplomatist, born 1755. After an active and changeful life as chaplain, lawyer, editor, land-agent, lecturer, and consul, he went to Paris and acquired a fortune On his return to America he was appointed Minister Plenipotentiary to France (1811), but died near Cracow in 1812 on his way to meet Napoleon. His principal poem, *The Columbiad* (*The Vision of Columbus*), dealing with American history from the time of Columbus, was published in 1807.

**BARM.** *See* YEAST.

**BAR'MECIDES** (-sīdz). A distinguished Persian family, whose virtues and splendour form a favourite subject with Mahommedan poets and historians. Two eminent members of this family were Khaled-ben-Barmek, tutor of Harun al Rashid, and his son Yahya, grand vizier of Harun. The expression *Barmecide Feast*, meaning a visionary banquet or make-believe entertainment, originates from the Barber's story of his Sixth Brother in the *Arabian Nights' Entertainments*.

**BAR'MEN.** A German city on the Wupper, in the Prussian Rhine Province, government of Düsseldorf, and forming a continuation of the town of Elberfeld, in the valley of Barmen. It has extensive ribbon and other textile manufactures; also dyeworks, manufactures of chemicals, metal wares, buttons, yarns, iron, machines, pianos, organs, soap, etc. In 1919 Barmen was the scene of Spartacist disorders. Pop. 174,840.

**BARMOUTH,** Welsh name **ABERMAW.** A small seaport and watering-place of Wales, in Merionethshire, at the entrance of Barmouth Bay, a fine estuary. It is picturesquely situated, and has become a favourite resort of tourists and others. Pop. (1931), 2491.

**BAR'NABAS.** The surname, according to Acts iv. 36-7, given by the apostles to Joseph, a fellow-labourer of St. Paul, and, like him, ranked as an apostle. He is said to have

founded at Antioch the first Christian community, to have been first Bishop of Milan, and to have suffered martyrdom at Cyprus. His festival is held on the 11th June.

**BARNABAS, Saint, Epistle of.** An epistle in twenty-one chapters unanimously ascribed to Barnabas by early Christian writers, but without any support of internal evidence. It was probably written about A.D. 130 (or, according to others, between A.D. 70 and 79) by one who was not a Jew, and under the influence of Alexandrian Judaistic thought. *See* CODEX (SINAITICUS).

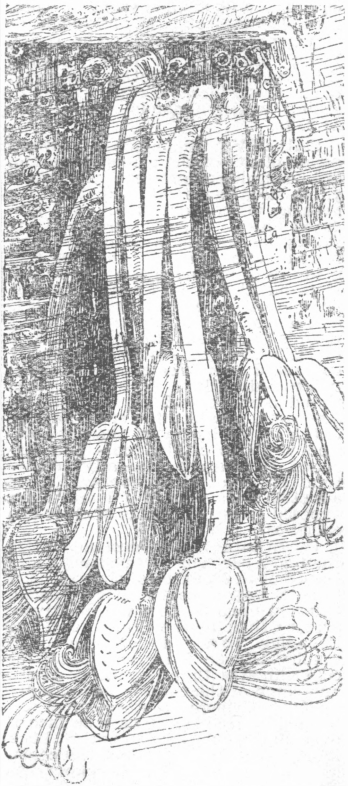
**BARNABITES.** An order of monks founded in Milan in 1530 and named after the Milan church of St. Barnabas which was allotted them to preach in. On their expulsion from France in 1905, the majority of the Barnabites sought refuge in England. A few monasteries of the order still exist in Italy, Belgium, Austria, and Spain.

**BAR'NACLE.** The name of a family (Lepadidæ) of marine crustaceous animals, ord. Cirripedia. They are enveloped by a mantle and shell, composed of five principal valves and several smaller pieces, joined together by a membrane attached to their circumference; and they are furnished with a long, flexible, fleshy stalk or peduncle, provided with muscles, by which they attach themselves to ships' bottoms, submerged timber, etc. They feed on small marine animals, brought within their reach by the water and secured by their tentacula. Some of the larger species are edible. According to an old fable, these animals produced barnacle geese.

**BARNACLE GOOSE** (*Anser Bernicla* or *leucopsis*). A summer visitant of the northern seas, in size rather smaller than the common wild goose, and having the forehead and cheeks white, the upper body and neck black. A fable asserts that the crustaceans called barnacles changed into geese, and various theories have been framed to account for its origin. Max Müller supposes the geese were originally called *Hiberniculæ* or Irish geese, and that barnacle is a corruption of this; but the resemblance of a barnacle to a goose hanging by the head may account for it. The Brent Goose is also sometimes called the Barnacle Goose, but the two should not be confused.

**BARNARD-CASTLE.** A town, England, County Durham, giving name to a parliamentary division of the county. There are a large thread-mill and carpet manufactories; the Bowes Museum and Art Gallery, endowed by private munificence and costing over £80,000; and the Northern Counties School, richly endowed. The castle was originally built about 1178 by Bernard Baliol. Pop. (1931), 3883.

**BARNAR'DO, Thomas John.** Philanthropist, born in Ireland in 1845, qualified as a medical practitioner, studying in London, Edinburgh, and Paris, established his first home for neglected London children in 1867, and for the rest of his life was engaged in the same class of work. Up to his death in 1905 he had nearly



Barnacles hanging from timber

60,000 destitute waifs cared for and trained in the institutions with which his name is connected, many of the children having been sent to Canada or other colonies. The Barnardo homes and institutions have become very numerous, being established in

various English counties as well as in London, a few being in Canada. A naval training-school for boys is included among them. It was a rule of the founder that no destitute child should be refused admission.

The homes have since 1899 been under a council or body incorporated under the title of the National Incorporated Waifs Association, but continue to be managed on the same lines as before. Dr. Barnardo published *Something Attempted, Something Done*; *The Rescue of Waifs*, etc. —Cf. J. H. Batt, *Dr. Barnardo, the Foster-father of Nobody's Children*.

**BARNAUL'.** A town of Siberia, government of Tomsk, on the Barnaulski, near its influx into the Ob'. The town is of wood but well built, with museum, observatory, etc. It is an important mining centre for lead, copper, and silver, has a copper-mint, kilns, and factories. Pop. 47,000.

**BARNAVE** (bår-näv), **Antoine-Pierre-Joseph-Marie.** A distinguished French revolutionist born 1761, died 1793. He successfully maintained against Mirabeau the right of the National Assembly, as against that of the king, to declare for peace or war, but afterwards asserted the inviolability of the king's person. He was impeached, condemned, and guillotined.

**BARN DANCE.** A popular dance in Scotland. It is danced by two persons to a tune resembling a Scottish air. It was introduced into London at the Gaiety Theatre about 1890, the name coming from the U.S.A.

**BARNES.** A municipal borough of England, in Surrey, on the right bank of the Thames, a short distance above London, connected with Middlesex by Hammersmith Suspension Bridge. There is here a common of 120 acres, one of the preserved open spaces of the metropolitan area. Pop. (1931), 42,439.

**BARNES** (bärnz), **Albert.** Theologian, born in the State of New York, 1798. In 1825 he was ordained pastor of the Presbyterian Church of Morristown, New Jersey, and from 1830 till his death in 1870 had charge of the first Presbyterian Church in Philadelphia. He is chiefly known by his *Notes on the New Testament* and *Notes on the Old Testament*.

**BARNES, Rt. Hon. George Nicoll.** British Labour leader, born at Dundee, in Scotland, in 1859. After working as an engineer he became assistant secretary of the Amalgamated Society of Engineers in 1892, and was general secretary from 1896 to 1806. He entered Parliament in 1906, became Minister for Pensions in 1916, member of War Cabinet in 1917, and was Minister without portfolio from 1919 to Jan., 1920. He was a British representative at the Peace Conference in Paris.

**BARNES, William.** English dialect poet and philologist, born in Dorsetshire in 1800, died 1886. Of humble birth, he first entered a solicitor's office, then taught at a school in Dorchester, and having taken orders became rector of Winterbourne Came in his native county and died there. He acquired a knowledge of many languages, and published works on Anglo-Saxon and English, as *An Anglo-Saxon Delectus*, *A Philological Grammar* (grounded upon English), *Grammar and Glossary of the Dorset Dialect*, etc., but is best known by his *Poems of Rural Life in the Dorset Dialect and Poems of Rural Life in Common English*.

**BAR'NET.** A town of England, in Herts, 11 miles from London, where was fought in 1471 a battle between the Yorkists and Lancastrians, resulting in the defeat of the latter and the death of Warwick. Edward IV. being thus established king. Pop. (1931), 14,721.

**BARNETT, John.** Musical composer, son of Bernhard Beer, a German, born at Bedford 1802, died 1890. He composed music as a lad, and his songs and ballads soon had great vogue. In 1834 his opera *The Mountain Sylph* was produced with success, and three years after was followed by the less successful *Fair Rosamond*. For many years before his death he was little heard of.

**BARNETT, John Francis.** Nephew of the former, born in 1837, died in 1916, was also a distinguished musician and teacher, author of cantatas: *The Ancient Mariner*, *Paradise and the Peri*, *The Raising of Lazarus*, *The Building of the Ship*, and of various other works.

**BARNEVELDT** (bär'ne-velt), **Johan van Olden.** Grand pensionary of Holland during the struggle with Philip II. of Spain, born in 1547. After the assassination of William of Orange, and the conquest of the south provinces by the Spaniards under Parma, he headed the embassy to secure English aid. Finding, however, that the Earl of Leicester proved a worse than useless ally, he secured the elevation of the young Maurice of Nassau to the post of Stadtholder, at the same time by his own wise administration doing much to restore the prosperity of the State. After serving as ambassador to France and England, he succeeded in 1607 in obtain-

ing from Spain a recognition of the independence of the States, and two years later in concluding with her the twelve years' truce. Maurice, ambitious of absolute rule and jealous of the influence of Barneveldt, was interested in the continuance of the war, and lost no opportunity of hostile action against the great statesman. In this he was aided by the strongly-marked theologic division in the State between the Gomarites (the Calvinistic and popular party) and the Arminians, of whom Barneveldt was a supporter.

Maurice, who had thrown in his lot with the Gomarites, encouraged the idea that the Arminians were the friends of Spain, and procured the assembly of a synod at Dort (1618), which violently condemned them. Barneveldt and his friends Grotius and Hoogerbeets were arrested, and subjected to a so-called trial; and Barneveldt, to whom the country owed its political existence and the Commons their retention of legislative power, was beheaded on 13th May, 1619. His sons, four years later, attempted to avenge his death; one was beheaded, the other escaped to Spain.

**BARNOLDSWICK.** An urban district of England, West Riding of Yorkshire, 9 miles south-west of Skipton, with cotton manufactures and other industries. Pop. (1931), 11,915.

**BARNS'LEY.** A county borough of England, West Riding of Yorkshire. Its staple industries are the manufacture of linens, iron, and steel, and there are numerous collieries in the neighbourhood. Created a parliamentary borough in 1918, Barnsley returns one member to Parliament. Pop. (1931), 71,522.

**BARN'STAPLE.** A county and municipal borough in England, county of Devon, giving its name to a parliamentary division of the county on the right bank of the Taw, where it receives the Yeo; manufactures of lace, paper, pottery, furniture, toys and turnery, and leather. Pop. (1931), 14,693.

**BAROACH.** *See* BROACH.

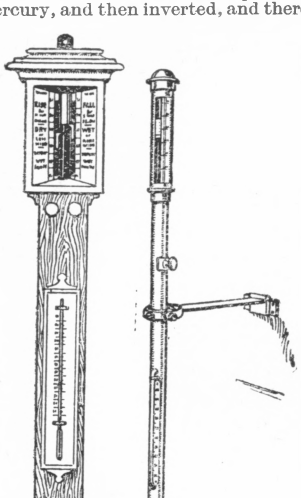
**BARO'DA.** A non-tributary State, but subordinate to the Indian Government, situated in the north of the Bombay presidency. It consists of a number of detached territories in the province of Guzerat, and is generally level, fertile, and well cultivated, producing luxuriant crops of grain, cotton, tobacco, opium, sugar-cane, and oil-seeds. There is a famous breed of large white oxen used as draught cattle. Area, 8127 sq. miles; pop. (1921), 2,126,522. The ruler is called the *Gaekwár*. The dissensions of the Baroda family have more than once called for British intervention, and in 1875 the ruling Gaekwár was tried and deposed in connection with the charge of attempting to poison the British Resident. Since 1908 there is a Legislative Council of 17 members. —*Baroda*, the capital, is the third city in the Bombay presidency. It consists of the city proper within the walls and the suburbs without, and is largely composed of poor and crowded houses, but has also some fine buildings, and is noted for its Hindu temples kept up by the State. Pop. 94,712.—Cf. E. St. C. Weeden, *A Year with the Gaekwár of Baroda*.

**BAROGRAPH.** A kind of aneroid barometer, which, by means of special mechanism and appliances, is made to furnish automatically a continuous record of the successive changes in atmospheric pressure. The paper that receives the record is made to move by clockwork while in contact with the index pencil, which rises and falls according to alterations of atmospheric pressure.

**BAROM'ETER.** An instrument for measuring the weight or pressure of the atmosphere and thus determining changes in the weather, the height of mountains, and other phenomena. It had its origin about the middle of the seventeenth century in an experiment of Torricelli, an Italian, who found that if a glass tube about 3 feet in length, open at one end only, and filled with mercury, were placed vertically with the open end in a cup of the same fluid metal, a portion of the mercury descended into the cup, leaving a column only about 30 inches in height in the tube. He inferred, therefore, that the atmospheric pressure on the surface of the mercury in the cup forced it up the tube to the height of 30 inches, and that this was so because the weight of a column of air from the cup to the top of the atmosphere was only equal to that of a column of mercury of the same base and 30 inches high. Pascal confirmed the conclusion in 1645; six years afterwards it was found by Perrier that the height of the mercury in the Torricellian tube varied with the weather; and in 1655 Boyle proposed to use the instrument to measure the height of mountains.

**Cistern.** The common or *cistern* barometer, which is a modification of the Torricellian tube, consists of a glass tube 33 inches in length and about one-third of an inch in diameter, hermetically sealed at the top, and having the lower end resting on a small vessel containing mercury, or

bent upwards and terminating in a glass bulb partly occupied by the mercury and open to the atmosphere. The tube is first filled with purified mercury, and then inverted, and there



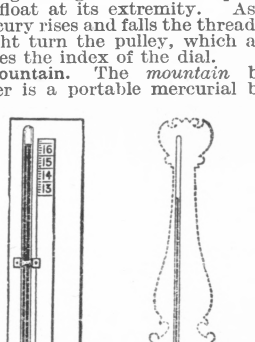
Common Upright Barometer — Marine Barometer

is affixed to it a scale to mark the height of the mercurial column, which comparatively seldom rises above 31 inches or sinks below 28 inches. In general the rising of the mercury presages fair weather, and its falling the contrary, a great and sudden fall being the usual presage of a storm. The weather-points on the ordinary barometric scale are as follows: At 28 inches, stormy weather; 28½, much rain or snow; 29, rain or snow; 29½, changeable; 30, fair or frost; 30½ settled fair or frost; 31, very dry weather or hard frost. Certain attendant signs, however, have also to be noted: thus, when fair or foul weather follows almost immediately upon the rise or fall of the mercury, the change is usually of short duration; while if the change of weather be delayed for some days after the variation in the mercury, it is usually of long continuance. The direction of the wind has also to be taken into account.

**Siphon.** The *siphon* barometer consists of a bent tube, generally of uniform bore, having two unequal legs, the longer closed, the shorter open. A sufficient quantity of mercury having been introduced to fill the longer leg, the instrument is set upright, and the mercury takes such a position that the difference of the levels in the two legs represents the pressure of the atmosphere. In the best siphon barometers there are two scales, one for each leg, the divisions on one being reckoned upwards, and on the other downwards from an intermediate zero point, so that the sum of the two readings is the difference of levels of the mercury in the two branches.

**Wheel.** The *wheel* barometer is the one that is most commonly used for domestic purposes. It is far from being accurate, but it is often preferred for ordinary use on account of the greater range of its scale, by which small differences in the height of the column of mercury are more easily observed. It usually consists of a siphon barometer having a float resting on the surface of the mercury in the open branch, a thread attached to the float passing over a pulley, and having a weight as a counterpoise to the float at its extremity. As the mercury rises and falls the thread and weight turn the pulley, which again moves the index of the dial.

**Mountain.** The *mountain* barometer is a portable mercurial baro-

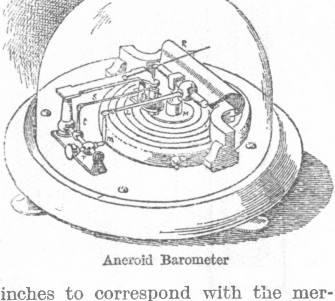


Siphon Barometer — Wheel Barometer

meter with a tripod support and a long scale for measuring the altitude of mountains. To prevent breakage, through the oscillations of such a

heavy liquid as mercury, it is usually carried inverted, or it is furnished with a movable basin and a screw, by means of which the mercury may be forced up to the top of the tube. For delicate operations, such as the measurement of altitudes, the scale of the barometer is furnished with a nonius or vernier, which greatly increases the minuteness and accuracy of the scale. For the rough estimate of altitudes the following rule is sufficient: As the sum of the heights of the mercury at the bottom and top of the mountain is to their difference, so is 52,000 to the height to be measured in feet. (*See also* HEIGHTS, MEASUREMENT OF.) In exact barometric observations two corrections require to be made, one for the depression of the mercury in the tube by capillary attraction, the other for temperature, which increases or diminishes the bulk of the mercury. In regard to the measurement of heights, the general rule is to subtract the ten-thousandth part of the observed altitude for every degree of Fahrenheit above 32°.

**Aneroid.** In the *aneroid* barometer, as its name implies (Gr. *a*, not, *nēros*, liquid), no fluid is employed, the action being dependent upon the susceptibility to atmospheric pressure shown by a flat circular metallic chamber from which the air has been partially exhausted, and which has a flexible top and bottom of corrugated metal plate. By an ingenious arrangement of springs and levers the depression or elevation of the surface of the box is registered by an index on the dial, by which means it is also greatly magnified, being given in



Aneroid Barometer

inches to correspond with the mercurial barometer. Aneroids are, however, generally less reliable than mercurial barometers, with which they should be frequently compared. The illustration shows an aneroid without its case. At the centre of the partially exhausted metal chamber is a small pillar M, connected with a steel spring R. The rise and fall of the top of the chamber, due to changing atmospheric pressure, is transmitted by means of the levers L and *m* to a metallic axis *r*, and this axis carries a lever *t*, whose end is attached to a chain *s*, which turns a drum on whose axis the index needle is fixed.—BIBLIOGRAPHY: C. Abbe, *Meteorological Apparatus*; Marvin, *Barometers and the Measurement of Atmospheric Pressure*.

**BAR'ON.** Originally, in the feudal system, the vassal or immediate tenant of any superior; but the term was afterwards restricted to the king's barons, and again to the greater of these only, who attended the Great Council, or who, at a later date, were summoned by writ to Parliament. It was the second rank of nobility, until dukes and marquesses were introduced and placed above the earls, and viscounts also set above the barons, who therefore now hold the lowest rank in the British peerage. The present barons are of three classes: (1) barons by writ, whose ancestors have long sat in the Upper House; (2) by patent; (3) by tenure, i.e. holding the title as annexed to land. The coronet is a plain gold circle with six balls or "pearls" on its edge, the cap being of crimson velvet.

**BARON AND FEME.** A term used for husband and wife in English law.

**BAR'ONET.** A hereditary dignity in Great Britain and Ireland, next in rank to the peerage, originally instituted by James I. in 1611, nominally to promote the colonization and defence of Ulster, each baronet, on his creation, being then obliged to pay into the treasury a sum of £1095, exclusive of fees. Baronets of Ireland were instituted in 1620, and of Scotland in 1625, the latter being called baronets of Nova Scotia, because their creation was originally intended to further the colonization of Nova Scotia. But the baronets of Scotland and of England have been baronets of Great Britain if created since 1707; since 1801 all creations have been known as baronetcies of the United Kingdom. A baronet has the title of "Sir" prefixed to his Christian and surname, and his wife is "Lady" so-and-so. Baronets rank before all knights except Knights of the Garter, the Thistle, and St. Patrick. They have as their badge a "bloody hand" (the arms of Ulster), that is, a left hand, erect and open, cut off at the wrist, and red in colour. In 1929 permission was given for the badge to be worn suspended from the neck by an orange ribbon with dark blue edges.

**BARO'NIUS,** or **BARONIO,** Cæsar. Italian ecclesiastical historian, born 1538; educated at Naples; in 1557 went to Rome; was one of the first pupils of St. Philip of Neri, and member of the oratory founded by him; afterwards cardinal and librarian of the Vatican Library. He owed these dignities to the services which he rendered the Church by his *Ecclesiastical Annals*, comprising valuable documents from the papal archives, on which he laboured from the year 1580 until his death, 30th June, 1607. They were continued, though with less power, by other writers, of whom Raynaldus takes the first rank; others are Laderchi and Theiner.

**BARON OF BEEF.** Two sirloins not cut asunder.

**BARONS' WAR.** The war carried on for several years by Simon de Montfort and other barons of Henry III. against the king, beginning in 1263.

**BARONY.** A manor or landed estate under a baron, who formerly had certain rights of jurisdiction in his barony and could hold special courts. In Ireland baronies are still the chief subdivisions of the counties.

**BAROQUE.** A term used to describe any style of architecture distinguished by extravagant ornamentation. It refers also to the decadent style that flourished in Italy from the 16th to the 18th century.

**BAROSMA.** *See* BUCKU.

**BAROT'SELAND.** A former kingdom of South Africa, now a part of Rhodesia.

**BAROUCHE** (ba-rösh'). A four-wheeled carriage with a falling top and two inside seats in which four persons can sit, two facing two.

**BARQUE** (bärk). A three-masted vessel of which the fore-mast and main-mast are square-rigged, but the mizzen-mast has fore-and-aft sails only.

**BARQUISIMETO** (bär-kē-sē-mā'tō). A city in the north of the Rupublic of Venezuela, capital of the State of Lara. Pop. 23,943.

**BAR'RA,** or **BAR.** A small kingdom in Africa, near the mouth of the Gambia. The Mandingoes, who form a considerable part of the inhabitants, are Mahommedans and the most civilized people on the Gambia. Pop. 200,000. The coast here belongs to Britain. The chief town is Barrinding, where the so-called king resides. *See* GAMBIA.

**BARRA.** An island of the Outer Hebrides, west coast of Scotland, belonging to Inverness-shire; 8 miles long and from 2 to 5 miles broad, of irregular outline, with rocky coasts, surface hilly but furnishing excellent pasture. On the west coast the Atlantic, beating with all its force, has hollowed out vast caves and fissures. Large herds of cattle and flocks of sheep are reared on the island. The coasts of this and adjacent islands abound with fish, and fishing is an important industry. The inhabitants (2250 in 1931) are Roman Catholics, and speak Gaelic.

**BARRA.** A town about 3 miles east of Naples. Pop. 12,080.

**BARRACAN',** or **BARRAGAN.** Strictly, a thick strong stuff made in Persia and Armenia of camel's hair, but the name has been applied, by Byron and others, to various wool, flax, and cotton fabrics.

**BAR'RACK** (Sp. *barraca*). Originally a small cabin or hut for troops, but now applied to the permanent buildings in which troops are lodged. Despite the obvious evils of the quartering system, the introduction of barracks by Goerge III. met with considerable opposition in the British Parliament as dangerous to liberty, by estranging the soldier from the citizen, and fitting him to become a tool of despotism.

**BARRACKPUR** (-pör'). A town and military cantonment, India, on the left bank of the Hughli, 10 miles N.N.E. of Calcutta. The suburban residence of the Viceroy is in Barrackpur Park. Pop. about 40,000.

**BARRACOON'.** A negro barrack or slave depot, formerly plentiful on the west coast of Africa, in Cuba, Brazil, etc.

**BARRACU'DA.** A name for certain large and ferocious fishes of the genus Sphyræna, and allied to the mullets, inhabiting southern seas, and caught in abundance for food.

**BARRAFRAN'CA.** A town of Sicily, province Caltanissetta. Pop. 11,170.

**BARRAGE.** A bar used to make a river increase the depth of water, e.g. the Nile barrages. The name is also applied to a volume of artillery fire directed on a definite area. A creeping barrage is a volume of fire intended to protect advancing troops.

**BARRAMUN'DA.** *See* CERATODUS.

**BARRANQUILLA** (bär-rän-kēl'yä). A port of S. America, in Colombia, on a branch of the River Magdalena, near its entrance into the Caribbean Sea, connected by rail with the seaport Puerto Colombia. Pop. 64,543.

**BARRAS** (bä-rä), **Paul François Jean Nicholas, Comte de.** Member of

the French National Convention and of the Executive Directory, born in Provence 1755, died 1829. After serving in the army in India and Africa, he joined the revolutionary party and was a deputy in the *tiers état*. He took part in the attack upon the Bastille and upon the Tuileries, and voted for the death of Louis XVI. In the subsequent events he displeased Robespierre, and on this account joined the members of the committee, who foresaw danger awaiting them, and being entrusted with the chief command of the forces of his party he made himself master of Robespierre. On 4th Feb., 1795, he was elected president of the Convention, and on 5th Oct., when the troops of the sections which favoured the royal cause approached, Barras for a second time received the chief command of the forces of the Convention. On this occasion he employed General Bonaparte, for whom he procured the chief command of the army of the interior, and afterwards the command of the army in Italy. From the events of the 18th Fructidor (4th Sept., 1797) he governed absolutely until the 13th June, 1799, when Siéyès entered the Directory, and in alliance with Bonaparte procured his downfall in the revolution of the 18th Brumaire (9th Nov., 1799). He afterwards resided at Brussels, Marseilles, Rome, and Montpellier under surveillance. His *Memoirs* (in four volumes) were published in French and in English in 1895-6.

**BAR'RATRY.** In commerce, any fraud committed by the master or mariners of a ship, whereby the owners, freighters, or insurers are injured; as by deviation from the proper course of the voyage, by the captain, for his own private purposes; fraudulent negligence; embezzlement of any part of the cargo, etc.

**BARRATRY, Common.** In law, the stirring up of lawsuits and quarrels between other persons, the party guilty of this offence being indictable as a *common barrator* or *barretor*. The commencing of suits in the name of a fictitious plaintiff is common barratry. In old Scots law it denotes the taking of bribes by a judge.

**BARREL.** A well-known variety of wooden vessel; but the term is also used as a definite measure and weight. A barrel of beer is 36 gallons, of flour 196 lb., of beef or pork 200 lb. The Italian *barile* varies from 7 to 31 English gallons; the French *barrique* of Bordeaux contains 50 English gallons = 228 French litres.

**BARREL ORGAN.** A musical instrument usually carried by street musicians, in which a barrel, studded with pegs or staples, when turned round, opens a series of valves to admit air to a set of pipes, or acts upon wire strings like those of the piano, thus producing a fixed series of tunes.

**BARREN GROUNDS.** A large tract in the North-West Territories of Canada, extending northwards from Churchill River to the Arctic Ocean between Great Bear and Great Slave Lake and Hudson's Bay. It largely consists of swamps, lakes and bare rock.

**BARRHEAD'.** A town, Scotland, Renfrewshire, on the Levern, 7 miles S.W. of Glasgow; chief industries: printing of cottons, the spinning of cotton yarn, dyeing, bleaching, iron and brass founding, and sanitary ware. Pop. (1931), 12,308.

**BARRIE.** A town of Canada, province Ontario, 55 miles N.W. Toronto, picturesquely situated on Lake Simcoe, a favourite summer resort. Pop. 6420.

**BARRIE, Sir James Matthew.** A novelist and playwright, born in 1860 at Kirriemuir, Forfarshire; studied at Edinburgh University, graduating

Sir J. M. Barrie

as M.A. in 1882. After working on a Nottingham journal he was a journalist in London. His first book, *Better Dead* (1887), a satire on London life, was followed by the highly successful *Auld Licht Idylls* (1888), with its sequel *A Window in Thrums*

(that is, Kirriemuir) (1889). Among his novels and tales are *When a Man's Single*, *My Lady Nicotine*, *The Little Minister*, *Sentimental Tommy*, *Tommy and Grizel*, *The Little White Bird*. Successful plays are *Peter and Wendy*, *The Professor's Love Story*, *The Little Minister* (based on the novel), *The Admirable Crichton*, *Quality Street*, *Little Mary*, *Peter Pan*, *What Every Woman Knows*, *Dear Brutus*, *A Kiss for Cinderella*, *Mary Rose*. His plays on the whole have been even more successful than his other works. He was created a baronet in 1913, elected Rector of the University of St. Andrews in 1919, and Chairman of Incorporated Society of Authors in 1928.

**BARRIER REEF.** A coral reef, or rather series of reefs, extending for 1260 miles off the N.E. coast of Australia, at a distance from land ranging from 10 to 100 miles. In sailing along this coast, steamers generally take the route inside the reef, where there is a channel about 12 fathoms deep throughout, protected by the reefs themselves; the outer channel is safer for sailing vessels.

**BARRIER TREATY.** The treaty (1718) by which, when the Spanish Netherlands were ceded to Austria, the Dutch secured the right to garrison several border fortresses of the country at the expense of Austria, to serve as a barrier against France. It was declared void in 1781 by Joseph II.

**BAR'RINGTON, Daines.** Son of Viscount Barrington, lawyer, antiquarian, and naturalist, born 1727, died 1800. He wrote many papers for the Royal Society and the Society of Antiquaries; published some separate works, and was a correspondent of White of Selborne, who addressed to him a number of the letters in *The Natural History of Selborne*.

**BARRISTERS.** In England are persons who have been called to the Bar by one of the Inns of Court, namely the Middle Temple, Inner Temple, Lincoln's Inn, or Gray's Inn. They have the sole right of appearing or being heard at the Bar in the higher courts and are entitled to be heard in all courts, but (with one exception) must be instructed by a solicitor. (*See* BRIEF.) Before call they must have been members of their Inn, keeping terms there in the prescribed manner for three years, and must pass the prescribed examinations. Junior barristers wear gowns of bombasine or stuff, thus differing from King's Counsel, who wear silk gowns. Barristers are commonly spoken of as Counsel. The intervention of the solicitor between the barrister and his client is strictly adhered to except where prisoners have instructed their counsel personally either from the dock or in the cells. This separation does not prevail in some of the Dominions or in America, though there is a considerable body of opinion in the older states of America in favour of the English system.

The fee of a barrister is payable by the solicitor personally, to whom alone credit is given. His employment is strictly honorary, and no action is admissible either by counsel or against him. The client's interests are protected by the public opinion of the profession. Where a barrister is guilty of serious misconduct he will be corrected by the Benchers of his Inn.

All judges of the Supreme Court of Judicature and of the County Courts must be practising barristers of at least ten and seven years' standing respectively, and varying but similar qualifications are required for stipendiary magistrates, recorders of boroughs, and other like offices. The duties of a *revising barrister* are now performed by the local authority.

**BAR'ROS, João de.** Portuguese historian, born 1496. He was attached to the Court of King Emmanuel, who, after the publication in 1520 of Barros' romance, *The Emperor Clarimond*, urged him to undertake a history of the Portuguese in India, which appeared thirty-two years later. King John III. appointed Barros Governor of the Portuguese settlements in Guinea, and General Agent for these colonies, further presenting him in 1530 with the province of Maranham, in Brazil, for the purpose of colonization. For his losses by the last enterprise the king indemnified him, and he died in retirement in 1570.

**BARRO'SA.** A village, Spain, near the S.W. coast of Andalusia, near which General Graham, when abandoned by the Spaniards, defeated a superior French force in 1811.

**BAR'ROW.** A river in the south-east of Ireland, province Leinster, rising on the borders of the Leix and Offaly Counties, and after a southerly course joining the Suir in forming Waterford harbour. It is next in importance to the Shannon, and is navigable for vessels of 200 tons for 25 miles above the sea. Its principal tributary is the Nore.

**BAR'ROW, Isaac.** An eminent English mathematician and divine,

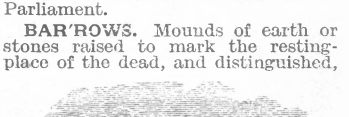
born in London in 1630; studied at the Charterhouse and at Trinity College, Cambridge, of which he became a fellow in 1649. After a course of medical studies he turned to divinity, mathematics, and astronomy, and took his M.A. degree in 1652, and, failing to obtain the Cambridge Greek professorship, went abroad. In 1659 he was ordained; in 1660 elected Greek professor at Cambridge; in 1662 professor of geometry in Gresham College; and in 1663 Lucasian professor of mathematics at Cambridge, a post which he resigned to Newton in 1669. In 1670 he was created D.D., in 1672 master of Trinity College, and in 1675 vice-chancellor of Cambridge University. He died in 1677. His principal mathematical works (written in Latin) were: *Euclidis Elementa* (1655); *Euclidis Data* (1657); *Mathematicæ Lectiones* (1664-6); *Lectiones Opticæ* (1669); *Lectiones Geometricæ* (1670); *Archimedis Opera*; *Apollonii Conicorum lib. iv.*; *Theodosii Spherica* (1675).

All his English works, which are theological, were left in MS., and published by Dr. Tillotson in 1685, the best edition being that prepared by the Rev. A. Napier in 1859. As a mathematician Barrow was deemed inferior only to Newton. The Latin edition of his mathematical works was prepared by Whewell in 1860.

**BARROW, Sir John, Bart.** Geographer and man of letters, born in 1764 in Lancashire. At the age of sixteen he went in a whaler to Greenland; and later on was teacher of mathematics in a school at Greenwich. In 1792 he was sent with Lord Macartney, in his embassy to China, to take charge of philosophical instruments for presentation to the Chinese emperor. His account of this journey was of great value, and not less so was the account of his travels in South Africa, whither he went in 1797 as secretary to Macartney. In 1804 he was appointed second secretary to the Admiralty, a post occupied by him for forty years. In 1835 he was made a baronet; and he died in 1848, three years after his retirement. Besides the accounts of his own travels, he published lives of Earl Macartney, Lord Anson, and Lord Howe; *Voyages of Discovery and Research within the Arctic Regions*; an *Autobiography* written at the age of eighty-three, etc.

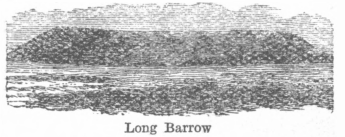
**BAR'ROW-IN-FUR'NESS.** A seaport, county and parliamentary borough of Lancashire, in the district of Furness, opposite the Island of Walney, a town that has increased from a fishing-hamlet with 100 inhabitants in 1848 to a town of 66,366 inhabitants in 1931. Its prosperity is due to the mines of red hematite iron-ore which abound in the district, and to the railway rendering its excellent natural harbour available. It has several large docks, besides graving-docks, a floating dock capable of receiving vessels of 3000 tons, a large timber pond, etc. There is an extensive trade in timber, cattle, grain, and flour; and iron-ore and pig-iron are largely shipped. It has numerous blast-furnaces, and one of the largest Bessemer-steel works in the world. Besides ironworks, a large business is done in shipbuilding, the making of railway wagons and rolling-stock, ropes, sails, bricks, etc. A town hall, erected at a cost of £60,000, was opened in 1887. Barrow-in-Furness returns one member to Parliament.

**BAR'ROWS.** Mounds of earth or stones raised to mark the resting-place of the dead, and distinguished,



Bowl Barrow

Long Barrow



Twin Barrow

according to their shape, as *long*, *bowl*, *bell*, *cone*, and *broad* barrows. The practice of barrow-burial is of unknown antiquity and almost universal, barrows being found all over Europe, in Northern Africa, Asia Minor, Afghanistan, Western India, and in America. In the earliest barrows the enclosed bodies were simply laid upon the ground, with stone or bone implements and weapons beside them. In barrows of later date the remains are generally

enclosed in a stone cist. Frequently cremation preceded the erection of the barrow, the ashes being enclosed in an urn or cist. A detailed description of an ancient barrow-burial is given in the Anglo-Saxon poem *Beowulf*.—BIBLIOGRAPHY: Canon W. Greenwell, *British Barrows*; J. Anderson, *Scotland in Pagan Times*; W. C. Borlase, *The Dolmens of Ireland*.

**BARROW STRAIT.** The connecting channel between Lancaster Sound and Baffin's Bay on the east and the Polar Ocean on the west. Named after Sir John Barrow.

**BARRY.** A seaport of S. Wales, Glamorganshire, 7 miles south-west of Cardiff, with large docks, exporting much coal. Pop. (1931), 38,916.

**BAR'RY, Sir Charles.** An English architect, born in London, 1795. After executing numerous important buildings, such as the Reform Clubhouse, London, St. Edward's School, Birmingham, etc., he was appointed architect of the new Houses of Parliament at Westminster, with the execution of which he was occupied for more than twenty-four years. He was elected a Royal Academician in 1844, was knighted in 1852, and died suddenly in 1860.

**BARRY, Comtesse Du.** *See* DU BARRY.

**BARRY, Edward Middleton, R.A.** (1830-80). Son of Sir Charles Barry, was also a distinguished architect, and designed many important buildings, though he was disappointed in regard to his plans for the Albert Memorial, National Gallery, and New Law Courts.

**BARRY, James.** A painter and writer on art, born at Cork, 1741; studied abroad with the aid of Burke; was elected Royal Academician on his return; and worked seven years on the paintings for the hall of the Society for the Encouragement of the Arts. His first picture which attracted attention was *St. Patrick baptizing the King of Cashel*. In 1773 he published his *Inquiry into the Real and Imaginary Obstructions to the Increase of the Arts in England*, and in 1782 was elected professor of painting to the Academy. He was expelled in 1797 on the ground of his authorship of the *Letter to the Society of Dilettanti*. His chief painting was his *Victors at Olympia*. He died in 1806.

**BARRY CORNWALL.** *See* PROCTER, BRYAN WALLER.

**BAR'SABBAS.** Surnamed Justus, son of Alpheus, brother of James the Less and of Judas, and one of the candidates for the apostolical office left vacant by Judas Iscariot. According to tradition, he was afterwards Bishop of Eleutheropolis, near Jerusalem, and suffered martyrdom. Another Barsabbas, named Judas, supposed to be the brother of the above, is mentioned in the Acts as a companion of St. Paul and Barnabas at Antioch. He is supposed to have died in Jerusalem at a very advanced age.

**BAR-SHOT.** A double-headed shot consisting of two pieces connected by a bar.

**BARSI.** A town of India, in Sholapur district, Bombay, 43 miles north of Sholapur and 128 miles east of Poona, with a trade in cotton, oil, etc. Pop. 21,000.

**BAR-SUR-AUBE** (bȧr-sûr-ōb). An ancient town, France, department Aube, where, in 1814, a hotly-contested action was fought between Napoleon and the Allies. Pop. 4533.

**BART, BARTH,** or **BAERT** (bȧ t), **Jean.** A famous French sailor, born at Dunkirk, 1650, the son of a poor fisherman. He became captain of a privateer, and after some brilliant exploits was appointed captain in the royal navy. In recognition of his further services he was made commodore, subsequently receiving letters of nobility. Brusque, if not vulgar, in manner, and ridiculed by the Court for his indifference to ceremony, he made the navy of the nation everywhere respected, and furnished some of the most striking chapters in the romance of naval warfare. After the Peace of Ryswick he lived quietly at Dunkirk, and died there while equipping a fleet to take part in the War of the Spanish Succession, 1702.

**BARTAS** (bȧr-tȧ), **Guillaume de Salluste du.** A French poet, termed "the divine" by contemporary English writers, born 1544. Principal work, *La Semaine ou la Création du Monde*, a poem on the creation, translated into English by Joshua Sylvester. It is said to have had a considerable influence on Milton's *Paradise Lost*. He died of wounds received at Ivry, 1590.

**BARTER.** A primitive method of exchanging goods without the intervention of any form of currency.

**BARTFELD** (bȧrt'felt). An old town in Czechoslovakia, formerly Hungary, county of Saros, on the Tepl, with mineral springs in the neighbourhood. Pop. 6160, mostly Slovaks.

**BARTH** (bȧrt), **Heinrich.** African traveller, born at Hamburg, 1821, died in 1865. He graduated at the University of Berlin as Ph.D. in 1844, and set out in 1845 to explore all the

countries bordering on the Mediterranean. The first volume of his *Wanderungen durch die Küstenländer des Mittelmeeres* was published in 1849, in which year he was invited by the British Government to join Dr. Overweg in accompanying Richardson's expedition to Central Africa. The expedition set out from Tripoli in Feb., 1850, and, in spite of the death both of Richardson and Overweg, Barth did not return to Tripoli till the autumn of 1855. His explorations, which extended over an area of about 2,000,000 sq. miles, determined the course of the Niger and the true nature of the Sahara. The English account of it was entitled *Travels and Discoveries in North and Central Africa* (5 vols., 1857-8). An important work on the African languages was left unfinished.

**BARTH, Jean.** *See* BART.

**BARTHÉLEMY** (bår-tål-mē), **Jean Jacques.** French author, born 1716. He was educated under the Jesuits, for holy orders, but declined all offers of clerical promotion above the rank of Abbé. He gained considerable repute as a worker in philology and archæology; and after his appointment as Director of the Royal Cabinet of Medals, in 1753, spent some time travelling in Italy collecting medals and antiquities. His best-known work, not inaptly characterized by himself as an unwieldy compilation, was his *Voyage de Jeune Anacharsis en Grèce* (1787). It was very popular and was translated into various tongues. Though taking no part in the revolution, he was arrested on a charge of being an aristocrat in 1793, but was set at liberty, and subsequently offered the post of librarian of the National Library. He died in 1795.

**BARTHÉLMY - SAINT - HILAIRE** (bår-tāl-mē-saṇ-tē-lār), **Jules.** French scholar and statesman, born 1805, died in 1895. He was professor of Greek and Latin philosophy in the Collège de France, but resigned the chair after the *coup d'etat* of 1852 and refused to take the oath. He was reappointed in 1862; and in 1869 was returned to the Corps Législatif. After the revolution he was a member of the National Assembly; and was elected Senator for life in 1876. He published a translation of Aristotle, and works on Buddhism, Mohammed and Mohammedanism, the Vedas, etc.

**BARTHEZ** (bår-tā), **Paul Joseph.** An eminent French physician, born at Montpellier 1734, died 1806. At Montpellier he founded a medical school, which acquired a reputation throughout all Europe. Having settled in Paris, he was appointed by the king consulting physician, and by the Duke of Orleans his first physician. The Revolution deprived him of the greatest part of his fortune, and drove him from Paris, but Napoleon brought him forth again, and loaded him in his advanced age with dignities. Among his numerous writings may be mentioned *Nouvelle Mécanique des Mouvements de l'Homme et des Animaux*; *Traitement des Maladies Goutteuses*; *Consultation de Médecine*, etc. His *Traité du Beau* was published posthumously (1807).

**BARTHOLDI** (bår-tol'dē), **Auguste.** French sculptor, born 1834, died 1904; best known for his colossal statue of Liberty, now overlooking the harbour of New York.

**BARTHOLIN** (bär'to-lin), **Kaspar.** Swedish writer, born 1585, died 1630. He studied medicine, philosophy, and theology; was made doctor of medicine at Basel in 1610, rector of the University of Copenhagen 1618, and professor of theology 1624. His *Institutiones Anatomicæ* was for long a standard textbook in the universities.—His son, Thomas, born at Copenhagen 1616, died 1680, was equally celebrated as a philologist, naturalist, and physician. He was professor of anatomy at Copenhagen, 1648; physician to the king, Christian V., in 1670: and Councillor of State, 1675.—His sons, Kaspar (born 1654, died 1704) and Thomas (born 1659, died 1690) were also highly distinguished—the former as an anatomist, the latter as an archæologist.

**BARTHOLOMEW, Massacre of St.** The brutal slaughter of the French Protestants, which began on 24th Aug., 1572, by secret orders from Charles IX., at the instigation of his mother, Catherine de' Medici, and in which, according to Sully, 70,000 Huguenots, including women and children, were murdered throughout the country. During the minority of Charles and the regency of his mother, a long war raged in France between the Catholics and Hugenots, the leaders of the latter being the Prince of Condé and Admiral Coligny. In 1570 overtures were made by the Court to the Huguenots, which resulted in a treaty of peace. This treaty blinded the chiefs of the Huguenots, particularly Admiral Coligny, who was tired of the civil war. The king appeared to have entirely disengaged himself from the influence of the Guises and his mother; he invited Coligny to his Court, and honoured him as a father. The most artful means were employed to increase this delusion. The sister of the king was

married to the Prince de Béarn (18th Aug., 1572) in order to allure the most distinguished Huguenots to Paris. On 22nd Aug. a shot from a window wounded the admiral. The king hastened to visit him, and swore to punish the author of the villainy; but on the same day he was induced by his mother to believe that the admiral had designs on his life. "God's death!" he exclaimed; "kill the admiral; and not only him, but all the Huguenots; let none remain to disturb us." The following night Catherine held the council, which fixed the execution for the night of St. Bartholomew, 24th Aug., 1572.

After the assassination of Coligny, a bell from the tower of the royal palace at midnight gave to the assembled companies of burghers the signal for the general massacre of the Huguenots. The Prince of Condé and the King of Navarre saved their lives by going to mass and pretending to embrace the Catholic religion. By the king's orders the massacre was extended throughout the whole kingdom; and the horrible slaughter continued for thirty days in almost all the provinces.—BIBLIOGRAPHY: Henry White, *Massacre of St. Bartholomew and History of the Religious Wars*; Lavisse, *Histoire de France* (vol. vi.).

**BARTHOL'OMEW, St.** The apostle is probably the same person as *Nathanael*, mentioned in the Gospel of St. John as an upright Israelite and one of the first disciples of Jesus. He is said to have taught Christianity in the south of Arabia, into which, according to Eusebius, he carried the Gospel of St. Matthew in the Hebrew language, and to have suffered martyrdom. The ancient Church had an apocryphal gospel bearing his name, of which nothing has been preserved. A festival is held in his memory on 24th Aug.

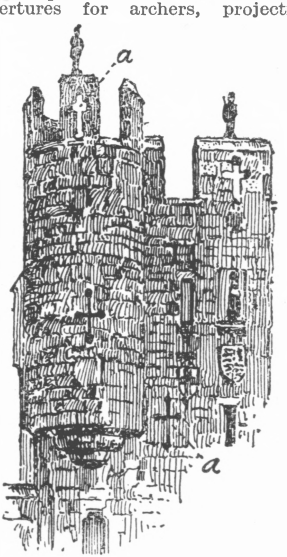
**BARTHOLOMEW, St., or ST. BARTHÉLEMY.** An island, one of the West Indies, in the Leeward group, belonging to France, about 24 miles in circumference. It produces some tobacco, sugar, cotton, indigo, etc. Pop. 3000. The only town is Gustavia. The island, occupied by France in 1648, was ceded to Sweden in 1784, but was again acquired by France in 1877 at the cost of 275,000 francs.

**BARTHOLOMEW FAIR.** A celebrated fair, established in the reign of Henry I. (1133), formerly held in West Smithfield, London, on St. Bartholomew's Day (24th Aug., O.S.), but abolished since 1855.

**BARTHOLOMEW'S HOSPITAL, St.** One of the great hospitals of London, formerly the priory of St. Bartholomew, and made a hospital by Henry VIII. in 1547. On an average over 6000 patients are annually admitted to the hospital, while about 150,000 out-patients are treated at its outdoor dispensaries. A medical school is attached to it, attended by more than four hundred students.

**BARTHOU, Louis.** French statesman, born at Oloron-Sainte-Marie in 1862. He practised as an advocate until he entered the Chamber of Deputies in 1889. He was a member of several Cabinets, and was appointed Premier in March, 1913, but resigned in December of the same year. He was Minister of Foreign Affairs in Painlevé's Cabinet during the European War. In April, 1922, he headed the French delegation to the Genoa Conference. His works include *Mirabeau*; *Lamartine, Orateur*; *Les Amours d'un poète*, etc.

**BAR'TIZAN.** A small overhanging turret pierced with one or more apertures for archers, projecting



Bartizan, Micklegate Bar, York
*a, a*, Balistraria

generally from the angles on the top of a tower, or from the parapet, or elsewhere, as in a mediæval castle. The word, probably a corruption of *brattícing*, was apparently first used by Sir Walter Scott.

**BART'LETT, Willian Henry.** An English artist, born 1809, died, on a

voyage from Malta to Marseilles, 1854. He travelled extensively abroad, and the illustrated works descriptive of the countries visited by him (Switzerland, the Bosporus and the Danube, Syria and Palestine, Egypt, Canada, United States, etc.) obtained great success with the public, the engravings being from sketches by his own pencil.

**BARTOLINI** (bär-to-lē'nē), **Lorenzo.** A celebrated Italian sculptor, born at Florence about 1778, died 1850. He studied and worked in Paris, and was patronized by Napoleon. On the fall of the Empire he returned to Florence, where he continued to exercise his profession. Among his greater works may be mentioned his groups of *Charity*, and *Hercules and Lichas*, a colossal bust of Napoleon, and the beautiful monument in the cathedral of Lausanne, erected in memory of Lady Stratford Canning. Bartolini ranks next to Canova among modern Italian sculptors.

**BARTOLOMMEO** (-mā'o), **Fra,** or **BACCIO DELLA PORTA** (bächō'). Italian painter, born at Florence 1475, died there 1517. He studied painting in Florence, and acquired a more perfect knowledge of art from the works of Leonardo da Vinci. He was an admirer and follower of Savonarola, on whose death he took the Dominican habit, and assumed the name of Fra Bartolommeo. He was the friend of Michelangelo and Raphael; painted many religious pictures, among them a *Saint Mark* and a *Saint Sebastian*, which are greatly admired. His colouring, in vigour and brilliancy, comes near to that of Titian and Giorgione. His *Holy Family* is in the National Gallery, London.

**BARTOLOZZI** (-lot'sē), **Francesco.** A distinguished engraver, born at Florence in 1725, or, according to others, in 1730, died at Lisbon 1815. In Venice, in Florence, and Milan he etched several pieces on sacred subjects, and then went to London, where he received great encouragement. After forty years' residence in London, he went to Lisbon on the invitation of the Prince Regent of Portugal. He became director of the National Academy at Lisbon, where he remained till his death.

**BARTON, Andrew.** One of Scotland's first great naval commanders; flourished during the reign of James IV., and belonged to a family which for two generations had produced able and successful seamen. In 1497 he commanded the escort which accompanied Perkin Warbeck from Scotland. After doing considerable damage to English shipping, he was killed in an engagement with two ships which had been specially fitted out against him (1512).

**BARTON, Bernard.** Known as the Quaker poet, born at Carlisle 1784, died 1849. In 1806 he removed to Woodbridge, in Suffolk, where he was long clerk in a bank. He published *Metrical Effusions* (1812); *Poems by an Amateur* (1818); *Poems* (1820); *Napoleon, and other poems* (1822); *Poetic Vigils* (1824); *Devotional Verses* (1826); *A New-year's Eve, and other Poems* (1828); besides many contributions to the annuals and magazines. His poetry, though deficient in force, is pleasing, fluent, and graceful. Barton is chiefly remembered as the friend of Charles Lamb, with whom he began to correspond in 1822.

**BARTON, Elizabeth.** A country girl born in 1506 at Adlington, in Kent (commonly called the Holy Maid or the Nun of Kent), who gained some notoriety in the reign of Henry VIII. She was subject to epilpetic fits, and was persuaded by certain priests that she was a prophetess inspired by God. Among other things she prophesied that Henry, if he persisted in his purpose of divorce and second marriage, would not be king for seven months longer, and would die a shameful death, and be succeeded by Catherine's daughter. On arrest the imposture was confessed, and Barton and six others were executed 5th May, 1534.

**BARTON-UPON-HUMBER.** A town of England, in Lincolnshire, on the Humber. It contains two old churches, one of which is an undoubted specimen of Anglo-Saxon architecture. Pop. (1931), 6330.

**BARTSCH** (bärch), **Karl Friedrich.** A German scholar, born in 1832, died in 1888, whose labours have been of immense service in elucidating the older literature and language of his native country as well as in the field of the Romance tongues. Among his publications were editions of the *Nibelungenlied*, *Walther von der Vogelweide*, *Kudrun*, etc.; *Chrestomathie de l'ancien Français*; *Provençalisches Lesebuch*; translations of Burns, of Dante, etc.

**BARTSIA.** A genus of Scrophulariaceæ, green half-parasites upon roots of grasses. Three species are British; *B. alpina* has underground shoots, not unlike those of the allied Toothwort, with fleshy scale-leaves bearing water-secreting glands.

**BARU** (ba-rō'). A woolly substance used for caulking ships, stuffing cushions, etc., found at the base of the leaves of an East India sago palm.

**BARUCH** (bā'ruk; literally, "blessed"). A Hebrew scribe, friend and assistant to the prophet Jeremiah. At the captivity, after the destruction of Jerusalem, Jeremiah and Baruch were permitted to remain in Palestine, but were afterwards carried into Egypt, 588 B.C. His subsequent life is unknown. One of the apocryphal books bears the name of Baruch. The Council of Trent gave it a place in the canon, but its authenticity was not admitted either by the ancient Jews or the early Christian fathers.

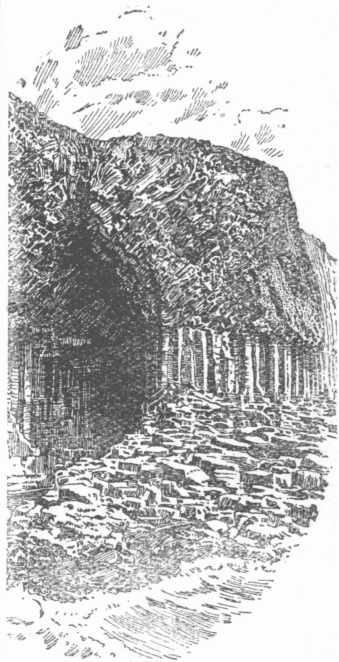
**BARWOOD.** A dyewood obtained from *Pterocarpus angolensis* a tall tree of West Africa. It is chiefly used for giving orange-red dyes on cotton yarns. *See* CAMWOOD; SANDALWOOD.

**BARYTA.** Oxide of barium (BaO) is found in nature associated with sulphuric acid as barium sulphate, heavy-spar or Barytes ($BaSO_4$), and with carbon dioxide as barium carbonate or witherite ($BaCo_3$). Baryta is a heavy greyish powder of specific gravity 4.7, obtained by burning barium in oxygen or from barium nitrate or barium carbonate. It has a strong affinity for water and combines with it in the evolution of lead and the formation of barium hydroxide ($Ba(OH)_2$). Barium oxide is manufactured in quantity for the preparation of barium dioxide ($BaO_3$), from which oxygen was at one time obtained. (*See* OXYGEN.) Baryta forms white crystalline salts with acids, which are all poisonous with the exception of barium sulphate. Barium hydroxide is soluble in water, forming a strongly-alkaline solution, Baryta water, which is much used in chemical analysis. Barium sulphate is a white substance insoluble in water and in acids, and is the source of most of the barium compounds. Artificially-prepared barium sulphate is used as a pigment, *Permanent White*, also in the paper industry and in vulcanizing rubber. Other salts of barium of importance are barium chloride, barium nitrate, and barium carbonate, used in pyrotechny and in glass manufacture.

**BARYTES (AMERICAN BARITE).** A rhombic mineral consisting of barium sulphate (specific gravity 4.5) occurring in veins and extensive masses as a subsequent deposit in various rocks. Colourless to brownish, the colourless massive examples being in great demand as a substitute for white lead in paint and for other purposes. Barytes is mined in the north of England and in County Cork.

**BARYTONE.** *See* BARITONE.

**BASALT** (ba-salt'). A well-known igneous rock occurring in the ancient trap and the recent volcanic series of rocks, but more abundantly in the former. It is a fine-grained, heavy, crystalline rock, consisting of felspar, augite, and magnetic iron, and sometimes contains a little olivine. Basalt is amorphous, columnar, tabular, or



Basaltic Columns, Fingal's Cave, Island of Staffa

globular. The columnar form is straight or curved, perpendicular or inclined, sometimes nearly horizontal; the diameter of the columns from 3 to 18 inches, sometimes with transverse hemispherical joints, in which the convex part of one is inserted in the concavity of another; and the height from 5 to 150 feet. The forms of the columns generally are pentagonal, hexagonal, or octagonal. When decomposed it is found also in round masses, either spherical or compressed and lenticular.

These rounded masses are sometimes composed of concentric layers, with a nucleus, and sometimes of prisms radiating from a centre. Fingal's Cave, in the Island of Staffa, furnishes a remarkable instance of

basaltic columns. The pillars of the Giant's Causeway, Ireland, composed of this stone, and exposed to the roughest sea for ages, have their angles as perfect as those at a distance from the waves. Basalt often assumes curious and fantastic forms, as, for example, those masses popularly known as "Samson's Ribs" at Arthur's Seat, Edinburgh, and "Lot" and "Lot's Wife" near the south coast of St. Helena.

**BAS'CINET, or BAS'NET.** A light helmet, sometimes with, but more frequently without, a visor, in general use for English infantry in the reigns of Edward II. and III. and Richard II.

**BASE.** In architecture, that part of a column which is between the top of the pedestal and the bottom of the shaft; where there is no pedestal, the part between the bottom of the column and the pavement. The term is also applied to the lower projecting part of the wall of a room, consisting of a plinth and its mouldings.

**BASE.** In chemistry, a term applied to those compound substances which unite with acids to form salts. The most important bases are oxides of metals, and when brought in contact with acids their oxygen combines with the hydrogen of the acid to form water. They are divided into several sections, of which the most important are the alkalies. These substances are the hydrates of the so-called alkaline metals, and may be compared to water in which part of the hydrogen is replaced by a metallic radicle. Potash, for instance, is the hydrate of the metal potassium. The alkalies are readily soluble in water, restore the blue colour to reddened litmus, and give a green with red cabbage, dahlia, and other vegetable blues, and convert the yellow of turmeric into a brownish red. Most of the bases, however, are insoluble in water, and without any effect on vegetable colours. *See* ALKALI; ACIDS.

**BASE.** A term in tactics, signifying the original line on which an offensive army forms; or any safe position from which an army takes the field to invade an enemy's country; upon which it depends for its supplies, reinforcements, etc.; to which it sends back its sick and wounded; and upon which it would generally fall back in case of reverse and retreat.

**BASE-BALL.** The national game of the United States of America. It holds the position there that is held by cricket in England. It is a scientific development of the old English game of "rounders," and is played by nine players a side. A diamond-shaped space of ground, 90 feet on the side, is marked out, the corners being the "bases." One side takes the field and the other sends a man to bat. When the field side takes its place, the "pitcher," standing inside the ground near the centre and in front of the batsman, delivers a ball to the batsman, who stands at the "home base" within a certain marked space, and who tries to drive it out of the reach of the fielders, and far enough out of the field to enable him to run round the bases, which scores a run. If he cannot run round all, he may stop at any one, and may be followed by another batsman. If the ball is caught by an opponent before touching the ground when the batsman is running, or if he is touched by the ball, he is out (also in several other cases), and when three on his side are put out, the field side take the bat. Nine of these innings make a game, which the highest score wins.

The bat is of a cylindrical shape, not more than 2½ inches in diameter nor more than 42 inches long. The ball is about 9 inches in circumference and weighs 5-5¼ oz. Base-ball is not a very old game, having attained its present position only since about 1845. Many professional players now engage in it. Attempts have been made to introduce it into Britain and Australia, but with little success.—BIBLIOGRAPHY: *Official Base-ball Guide*, in the Spalding Athletic Library (annually); R. H. Barbour, *The Book of School and College Sports*; A. G. Spalding, *America's National Game*; W. J. Clarke and F. T. Dawson, *Base-ball*.

**BASEDOW** (bă'ze-dō), **John Bernhard.** German educationalist, born in Hamburg 1723, died in 1790. After having gained considerable experience as a teacher, especially at the gymnasium of Altona, he published a number of works dealing with mental and moral philosophy, the teaching of religion and morality, etc., some of which roused a great amount of discussion. His watchword was "Everything according to nature." In 1771 he was called to Dessau by Prince Leopold, and in 1774 took charge of an educational institution in which his views were to receive practical exemplification. This institution, which he called the *Philanthropinum*, was a school free from sectarian bias, and in which the pupils were to be disciplined in all studies—physical, intellectual, and moral. This school led to the establishment of some similar ones, though Basedow retired from it in 1776, not having been very successful in the practical working out of his theories. His place was taken by Joachim Heinrich Campe (1746-1818).

He henceforth devoted himself to authorship, writing especially on religious subjects. The chief feature of Basedow's system is the full development of the faculties of the young, in pursuance of the notions of Locke and Rousseau. His name still lives in the history of education, and his efforts were not without result.—BIBLIOGRAPHY: J. C. Meyer, *Leben, Charakter und Schriften Basedows* (2 vols., 1791-2); A. Pinloche, *La Réforme de l'Education en Allemagne au dix-huitième Siècle*; O. H. Lang, *Basedow, His Life and Work*.

**BASEL** (bä'zl; Fr. *Bâle*). A canton and city of Switzerland. The canton borders on Alsace and Baden, has an area of 177 sq. miles, and a pop. of 223,098 (1920), nearly all speaking German. It is divided into two half-cantons, Basel city (Basel-Stadt) and Basel country (Basel-Land). The former consists of the city and its precincts, the remainder of the canton forming Basel-Land, the capital of which is Liestal. The whole canton belongs to the valley of the Rhine. The soil is generally well cultivated; and the climate in the low grounds allows of the cultivation of the vine and other fruits.—The city of *Basel* is 43 miles N. of Bern, and consists of two parts on opposite sides of the Rhine and communicating by three bridges, one of them an ancient wooden structure, besides a railway bridge. The older portions are irregularly built with narrow streets, and are now surrounded with pleasant promenades where the old fortifications existed. Basel has an ancient cathedral, founded 1010, containing the tombs of Erasmus and other eminent persons; the fine modern church of St. Elizabeth; town hall (1508); a university, founded by Pius II. in 1460; a seminary for missionaries; a bible society; a museum containing the valuable public library, pictures, etc.

**Industries.** The industries include silk ribbons (8000 hands), metal articles, tanning, paper, aniline dyes and other chemicals, brewing, etc., and the position of Basel, a little below where the Rhine becomes navigable and at the terminus of the French and German railways, has made it the emporium of a most important trade. At Basel was signed the treaty of peace between France and Prussia, 5th April, and that between France and Spain, 22nd July, 1795. Pop. (with suburbs), 135,976 (1920 census).

**BASEL, Council of.** A celebrated œcumenical council of the Church, convoked by Pope Martin V. and his successor Eugenius IV. It was opened 14th Dec., 1431, under the presidency of the Cardinal Legate Juliano Cesarini of St. Angelo. The objects of its deliberations were to extirpate heresies (that of the Hussites in particular), to unite all Christian nations under the Catholic Church, to put a stop to wars between Christian princes, and to reform the Church. But its first steps towards a peaceable reconcilation with the Hussites were displeasing to the Pope, who authorized the Cardinal Legate to dissolve the Council. That body opposed the pretensions of the Pope, and, notwithstanding his repeated orders to remove to Italy, continued its deliberations under the protection of the Emperor Sigismund, of the German princes, and of France. On the Pope continuing to issue bulls for its dissolution, the Council commenced a formal process against him, and cited him to appear at its bar. On his refusal to comply with this demand the Council declared him guilty of contumacy, and, after Eugenius had opened a counter-synod at Ferrara, decreed his suspension from the papal chair (24th Jan., 1438).

The removal of Eugenius, however, seemed so impracticable that some prelates, who till then had been the boldest and most influential speakers in the Council, including the Cardinal Legate Juliano, left Basel, and went over to the party of Eugenius. The Archibishop of Arles, Cardinal Louis Allemand, was now made first President of the Council, and directed its proceedings with much vigour. In May, 1439, it declared Eugenius, on account of his disobedience of its decrees, a heretic, and formally deposed him. Excommunicated by Eugenius, they proceeded, in a regular conclave, to elect the Duke Amadeus of Savoy to the papal chair. Felix V.—the name he adopted—was acknowledged by only a few princes, cities, and universities.

After this the moral power of the Council declined; its last formal session was held 16th May, 1443, though it was not technically dissolved till 7th May, 1449, when it gave in its adhesion to Nicholas V., the successor of Eugenius. The decrees of the Council of Basel are admitted into none of the Roman collections, and are considered of no authority by the Roman lawyers. They are regarded, however, as of authority in points of canon law in France and Germany, as their regulations for the Reformation of the Church have been adopted in the pragmatic sanctions of both countries, and, as far as they regard clerical discipline, have been actually enforced.

**BASE-LINE.** In surveying, a straight line measured with the utmost precision to form the starting-point of the triangulation of a country or district. *See* GEODESY.

**BASH.** *See* MINING.

**BA'SHAN.** The name in Scripture for a singularly rich tract of country lying beyond the Jordan between Mount Hermon and the land of Gilead. At the time of the Exodus it was inhabited by the Amorites, who were overpowered by the Israelites, and the land assigned to the half-tribe of Manasseh. The district was, and yet is, famous for its oak forests and its cattle. Remains of ancient cities are common.

**BASHAW, or BASHA.** *See* PASHA.

**BASHEE' ISLANDS.** A group of islands in the Chinese Sea between Luzon and Formosa, long. 122° E.; lat. 20° 28′ to 20° 55′ N. They were discovered by Dampier in 1687, and belong to the United States. The largest island is Batan, with a population of 8000.

**BASHI-BAZOOKS'.** Irregular troops in the Turkish army. They are mostly Asiatics, and have had to be disarmed several times by the regular troops on account of the barbarities by which they have rendered themselves infamous.

**BASH'KIR.** A constituent republic of the Russian S.F.S.R. (*see* RUSSIA); area, 40,020 sq. miles; pop. 1,268,132 (mainly Bashkirs). It is in Central Russia, east of the Tatar Republic. The capital is Ufa.

**BASHKIRS.** A tribe of Finno-Tatar origin, inhabiting the Russian governments of Ufa, Orenburg, Perm, and Samara. They are Mahommedans, and live by hunting, breeding of cattle and horses, and keeping of bees. They are rude and warlike, and partially nomadic. They number about 1,000,000.

**BASHKIRTSEV, Marie.** Russian painter and authoress, born 1860, died 1884; educated mostly outside of Russia, in France, Germany, and Italy; became an accomplished linguist and musician, and studied art in Paris, attaining high success, but overtaxing her system, with fatal results. She is best known from her journal, an intimate personal record, interesting not only as revealing her own peculiar character and intellectual gifts, but also for notices of the notable personages with whom she came in contact. It has been translated into various languages—into English by Mathilde Blind (1890), who has also published *A Study of Marie Bashkirtsev* (1892). A number of her letters were also published in 1891.—Cf. *The Journal of Marie Bashkirtsev, an Exposure and a Defence.*

**BASIC SLAG.** The slag or refuse-matter which is got in making basic steel, and which, from the phosphate of lime it contains, is a valuable fertilizer. *See* MANURES (PHOSPHATIC).

**BASIC STEEL.** *See* STEEL.

**BASI'DIOMYCETES.** One of the two sub-classes of the Eumycetes or septate Fungi, including the bulk of the larger and more familiar saprophytic types, such as the Mushroom, Toad-stools, Shelf-fungi, Puff-balls, and Earth-stars, and also the important parasites known as the Rusts. They are characterized by their principal spores being produced externally, usually in fours, upon a organ called a *basidium*. The basidia are arranged in a continuous layer (hymenium), and are usually massed together upon a specialized fruit-body, of which an ordinary mushroom is a good example. The principal subdivisions of the group, with representative genera, are as follows:

A. Basidia septate (Proto-Basidiomycetes).

1. Family Uredineæ (Rusts). Basidia transversely septate; teleutospores present; parasites. Puccinia, Phragmidium, Melampsora.

2. Family Auricularineæ. Basidia transversely septate; no teleutospores; saprophytes. Auricularia.

3. Family Tremellineæ. Basidia longitudinally septate; saprophytes. Tremella.

B. Basidia not septate (Auto-Basidiomycetes.

4. Family Exobasidiineæ. Parasites without fruit-body; basidia exposed on surface of host. Exobasidium.

5. Family Dacryomycetineæ. Fruit-body soft; hymenium on its surface; saprophytes. Dacryomyces, Calocera.

6. Group Hymenomycetes (several families). Hymenium generally on gills, in tubes, etc.; saprophytes or, less often, parasites. Agaricus Polyporus, Hydnum.

7. Group Gastromycetes (several families). Hymenium within a closed fruit-body, which does not open until the spores are ripe; saprophytes. Ithyphallus, Lycoperdon.

The Ustilagineæ (Smuts) are often regarded as Basidiomycetes of a low type, but it is more probable that they are allied to the Unicellular Chytridineæ. The Basidiomycetes are the highest members of the Fungoid alliance; their relations to the lower groups are obscure.

**BASI'DIUM.** The characteristic spore-producing organ of the Basi-

diomycetes. Typically, e.g. in the Toad-stools, it is a club-shaped structure, produced at its free end into four slender processes, the *sterigmata*, each of which bears a *basidiospore* at its tip. The young basidium contains two nuclei, which later fuse; the fusion-nucleus then undergoes two successive divisions, involving a reduction of chromosomes, and each of the four resultant nuclei passes through a sterigma into a basidiospore. These latter are thus seen to be carpospores, comparable to those of Red Algæ, and to the ascospores of Ascomycetes. The basidia of Uredineæ (Rusts) and of some other primitive Basidiomycetes are septate, but otherwise agree with the type described above. *See* BASIDIOMYCETES; CARPOSPORE; RUSTS.

**BASIL.** *See* BASILIUS.

**BAS'IL.** A labiate plant, *Ocimum basilicum*, a native of India, much used in cookery, especially in France, and known more particularly as sweet or common basil. Bush or lesser basil is *O. minimum*; wild basil belongs to a different genus, being the *Calamintha Clinopodium*.

**BASIL, St.** Called the *Great*, one of the Greek fathers, was born in 329, and made in 370 Bishop of Cæsarea in Cappadocia, where he died in 379. He was distinguished by his efforts for the regulation of clerical discipline and, above all, his endeavours for the promotion of monastic life. The Greek Church honours him as one of its most illustrious saints, and celebrates his festival on 1st Jan. The vows of obedience, chastity, and poverty framed by St. Basil are essentially the rules of all the orders of Christendom, although he is particularly the father of the Eastern, as St. Benedict is the patriarch of the Western orders.

**BASILAN'.** The principal island of the Sulu Archipelago, now belonging to the Philippines, off the S.W. extremity of Mindanao, from which it is separated by the Strait of Basilan. It is about 30 miles in length by 20 miles in breadth. Pop. about 8000.

**BASILE'AN MANUSCRIPTS.** Two manuscripts of the Greek New Testament now in the library of Basel. (1) A nearly complete uncial copy of the Gospels of the eighth century; (2) a cursive copy of the whole New Testament except the Apocalypse, tenth century.

**BASIL'IAN LITURGY.** That form for celebrating the Eucharist drawn up towards the close of the fourth century by Basil the Great, still used in the Greek Church.

**BASILIAN MONKS.** Monks who strictly follow the rules of St. Basil, chiefly belonging to the Greek Church.

**BASIL'ICA.** Originally the name applied by the Romans to their public halls, either of justice, of exchange, or other business. The plan of the basilica was usually a rectangle divided into aisles by rows of columns, the middle aisle being the widest, with a semicircular apse at the end, in which the tribunal was placed. The ground-plan of these buildings was generally followed in the early Christian churches, which, therefore, long retained the name of basilica, and it is still applied to some of th churches in Rome by way of distinction, and sometimes to other churches built in imitation of the Roman basilicas.

**BASILICA'TA,** also called **POTENZA.** An Italian province, extending north from the Gulf of Taranto, and corresponding pretty closely with the ancient Lucania. Area, 3855 sq. miles; pop. 467,812.

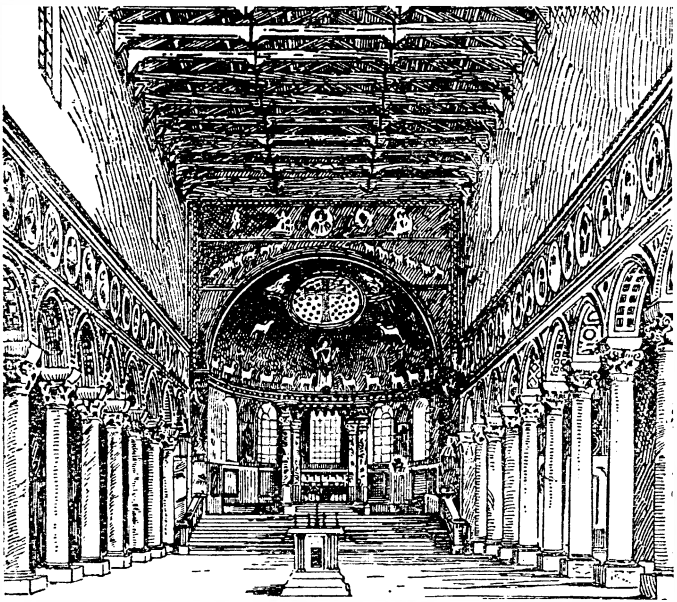
**BASIL'ICON.** A name of several ointments, the chief ingredients of which are wax, pitch, resin, and olive-oil.

**BASIL'ICON DO'RON** (the royal gift). The title of a book written by King James I. in 1599, containing a collection of precepts of the art of government. It maintains the claim of the king to be sole head of the Church. Printed at Edinburgh, 1603.

**BASIL'IDES** (dēz). One of the most famous Gnostic teachers, a native of Alexandria, who lived under the reigns of Adrian and Antoninus Pius about A.D. 120-40. He was well acquainted with Christianity, but mixed it up with the wildest dreams of the Gnostics, peopling the earth and the air with multitudes of *æons*. He was also greatly influenced by Platonism and Zoroastrianism. His disciples (Basilidians) were numerous in Syria, Egypt, Italy, and Gaul, but they are scarcely heard of after the fourth century.

**BAS'ILISK.** A fabulous creature formerly believed to exist, and variously regarded as a kind of serpent, lizard, or dragon, and sometimes identified with the cockatrice. It inhabited the deserts of Africa, and its breath and even its look was fatal. The name is now applied to a genus of saurian reptiles (Basiliscus), belonging to the family Iguanidæ, distinguished by an elevated crest or row of scales, erectable at pleasure, which, like the dorsal fins of some fishes, runs along the whole length of the back and tail. The mitred or hooded basilisk (*B. mitrātus*) is especially re-

markable for a membranous bag at the back of the head, of the size of a small hen's egg, which can be inflated with air at pleasure. The other species have such hoods also, but of a less size. To this organ they owe their name, which recalls the basilisk of fable, though in reality they are exceedingly harmless and lively creatures. The *B. amboinensis* is a native of the Indian Archipelago, where it is much used for food. It frequents trees overhanging water, into which it drops when alarmed.



Basilica di S'Apollinare in Classe, Ravenna

**BASIL'IUS I.** A Macedonian, Emperor of the East, born A.D. 820, died 886. He was of obscure origin, but having succeeded in gaining the favour of the Emperor Michael III., he became his colleague in the Empire, 866. After the assassination of Michael, 867, Basilius became emperor. Though he had worked his way to the throne by a series of crimes, he proved an able and equitable sovereign. The versatility, if not the depth, of his intellect is strikingly displayed in his *Exhortations to his Son Leo*, which are still extant.

**BASILIUS II.** Emperor of the East, born 958, died 1025. On the death of his father, the Emperor Romanus the Younger, in 963, he was kept out of the succession for twelve years by two usurpers. He began to reign in conjunction with his brother Constantine, 975. His reign was spent in almost perpetual warfare, his most important struggle being that which resulted in the conquest of Bulgaria, 1018.

**BA'SIN.** In physical geography, the whole tract of country drained by a river and its tributaries. The line dividing one river basin from another is the water-shed, and by tracing the various water-sheds we divide each country into its constituent basins. The basin of a loch or sea consists of the basins of all the rivers which run into it.—In geology a basin is any dipping or disposition of strata towards a common axis or centre, due to upheaval and subsidence. It is sometimes used almost synonymously with "formation" to express the deposits lying in a certain cavity or depression in older rocks. The "Paris basin" and "London basin" are familiar instances.

**BA'SINGSTOKE.** A municipal borough of England, Hants, 18 miles N.N.E. of Winchester. It has a good trade in corn, malt, etc., and now

gives its name to one of the parliamentary divisions of the county. Pop. (1931), 13,862.

**BAS'KERVILLE, John.** Celebrated English printer and type-founder, born in 1706, died 1775. He settled at Birmingham as a writing-master, subsequently engaged in the manufacture of japanned works, and in 1750 commenced printing. From his press came highly-prized editions of ancient and modern classics, Bibles, prayer-books, etc., all beautifully-printed works. His first work was a *Virgil*, published in 1757, followed by his famous edition of Milton in 1758.

**BASKET.** A vessel or utensil of wicker-work, made of interwoven osiers or willows, rushes, twigs, grasses, etc. The process of basket-making is very simple, and appears to be well known among the very rudest peoples. The ancient Britons excelled in the art, and their baskets were highly prized in Rome.—Cf. T. Okey, *Introduction to the Art of Basket-making.*

**BASKET BALL.** An outdoor game invented in 1891 in Massachusetts. The English variant of the game is called net ball.

**BASKING-SHARK** (*Selăchē maxima* or *Cetorhinus maximus*). A species of shark, so named from its habit of basking in the sun at the surface of the water. It reaches the length of 40 feet, and its liver yields a large quantity of oil. It frequents the northern seas, and is known also as the sail-fish or sun-fish.

**BASLE.** *See* BASEL.

**BASOCHE.** *See* BAZOCHE.

**BASQUES** (bǎsks), or **BISCAYANS** (in their own language, *Euscaldunac*). A remarkable race of people dwelling partly in the south-west corner of France (Basses-Pyrénées), but mostly in the north of Spain adjacent to the Pyrenees. They are probably descendants of the ancient Iberi, who occupied Spain before the Celts. They preserve their ancient language, former manners, and national dances, and make admirable soldiers, epecially in guerrilla warfare. Their language is highly polysynthetic, and stands isolated from other tongues of Europe. There are eight principal dialects, which are not only distinguished by their pronunciation and grammatical structure, but differ even in their vocabularies. The Basques, who number about 600,000 (450,000 in Spain, and 150,000 in France), occupy in Spain the provinces of Biscay, Guipuzcoa, and Alăva; in France parts of the departments of the Upper and Lower Pyrenees, Ariége, and Upper Garonne. The Basques are very religious and conservative in their religious practices. Ignatius Loyola and Francis Xavier de Navarre were Basques.—BIBLIOGRAPHY: Julien Vinson, *Les Basques et le pays Basque*; *Le Folk-lore du pays Basque*; Michel, *Le pays Basque, sa population, sa langue, ses mœurs, sa littérature, et sa musique*; Van Eys, *Outlines of a Basque Grammar.*

**BASRA, BASSORA,** or **BASRAH.** A city in Lower Mesopotamia, on the west bank of the Shatt al 'Arab (the united stream of the Tigris and Euphrates), about 50 miles from its mouth, and nearly 300 miles south-east of Baghdad. It is surrounded by a wall about 10 miles in circuit, from 20 to 25 feet thick; but much of the area enclosed is occupied by gardens, etc. The houses are generally mean. A considerable transit trade is carried on here between the Turkish and Persian dominions and India, and since communication by steamer has been established with Baghdad and Bombay the prosperity of the town has greatly increased. The chief exports are dates, camels and horses, wool and wheat; imports: coffee, indigo, rice, tissues, etc. The inhabitants are estimated at 80,000; but in the eighteenth century they were said to number 150,000. The substitution of date and wheat cultivation for that of rice has rendered the place much more healthy. The ruins of the ancient and more famous Bassora—founded by Caliph Omar in 636, at one time a centre of Arabic literature and learning and regarded as "the Athens of the East"—lie about 9 miles south-west of the modern town. The town was occupied by the British on 22nd Nov., 1914. The first through train from Basra to Baghdad was run in Jan., 1920.

**BAS-RELIEF** (bä'rē-lēf or bas'rē-lēf), or **BASSO-RILIEVO.** Low-relief, a mode of sculpturing figures on a flat surface, the figures having a very slight relief or projection from the surface. It is distinguished from *haut-relief* (*alto-rilievo*), or high-relief, in which the figures stand sometimes almost entirely free from the ground. Bas-relief work has been described as "sculptured painting," from the capability of disposing of groups of figures and exhibiting minor adjuncts, as in a painting. The finest specimen of bas-relief is the frieze around the cella of the Parthenon; large portions of it are to be seen in the British Museum.

**BASS** (bās; from the It. *basso*, deep, low). In music, the lowest part in the harmony of a musical com-

position, whether vocal or instrumental. According to some it is the fundamental or most important part, while others regard the melody or highest part in that light. Next to the melody, the bass part is the most striking, the freest and boldest in its movements, and richest in effect.—*Figured bass*, a bass part having the accompanying chords suggested by certain figures written above or below the notes—the most successful system of shorthand scoring at present in use among organists and pianists.—*Fundamental bass*, the lowest note or root of a chord; a bass consisting of a succession of fundamental notes.—*Thorough bass*, the mode or art of expressing chords by means of figures

Bas-relief—Northern frieze of Parthenon

placed over or under a given bass. Figures written over each other indicate that the notes they represent are to be sounded simultaneously, those standing close after each other that they are to be sounded successively. The common chord in its fundamental form is generally left unfigured, and accidentals are indicated by using sharps, naturals, or flats along with the figures.

**BASS** (bàs). The name of a number of fishes of several genera, but originally belonging to a genus of sea-fishes (Labrax) of the perch family, distinguished from the true perches by having the tongue covered by small teeth and the preoperculum smooth. *L. lupus*, the only British species, called also sea-dace, and from its voracity sea-wolf, resembles somewhat the salmon in shape, and is much esteemed for the table, weighing about 15 lb. *L. lineātus* (*Roccus lineātus*), or striped bass, an American species, weighing from 25 to 30 lb., is much used for food, and is also known as rock-fish. Both species occasionally ascend rivers, and attempts have been made to cultivate British bass in fresh-water ponds with success. Two species of black bass (*Micropterus salmoides* and *M. dolomieu*), American freshwater fishes, are excellent as food and give fine sport to the angler. The former is often called the large-mouthed black bass, from the size of its mouth. Both make nests and take great care of their eggs and young. The *Centropristis nigricans*, an American sea-fish of the perch family, and weighing 2 to 3 lb., is known as the sea-bass.

**BASS** (bàs), **The.** A remarkable insular trap-rock, at the mouth of the Firth of Forth, 3 miles from North Berwick, of a circular form, about 1 mile in circumference, rising majestically out of the sea to a height of 313 feet. It pastures a few sheep, and is a great breeding-place of solan geese. During the persecution of the Covenanters its castle, long since demolished, was used as a State prison, in which several eminent Covenanters were confined. It was held from 1691 to 1694 with great courage and pertinacity by twenty Jacobites, who in the end capitulated on highly honourable terms.

**BASS.** *See* BASSWOOD.

**BASSA'NO.** A commercial city of North Italy, province of Vicenza, on the Brenta, over which is a covered wooden bridge. It has lofty old walls and an old castle, and has various industries and an active trade. Near Bassano, 8th Sept., 1796, Bonaparte defeated the Austrian general Wurmser. Pop. (commune), 17,130.

**BASSA'NO** (from his birth-place; real name **GIACOMO DA PONTE**). An Italian painter, born 1510, died 1592. He painted historical pieces, landscapes, flowers, etc., and also portraits. He left four sons, who all became painters, Francesco being the most distinguished.

**BASSANO DAM.** *See* DAMS.

**BAS'SARIS.** *See* CACOMISTLE.

**BASSEIN** (bas-sān'). A town in Lower Burma, province of Pegu, on both banks of the Bassein River, one of the mouths of the Irrawaddy, and navigable for the largest ships. It has considerable trade, exporting large quantities of rice, and importing coal, salt, cottons, etc. Pop. 37,081.—Bassein District has an area of 4127 sq. miles and a pop. of 400,000.

**BASSEIN** (bas-sān'). A town in India, 28 miles north of Bombay. At the beginning of the eighteenth century it was a fine and wealthy city, with over 60,000 inhabitants; it has now only about 10,000.

**BASSELIN** (bâs-laṇ), **Olivier.** An old French poet or song-writer, born in the Val-de-Vire, Normandy, about the end of the fourteenth century, died about 1450. His sprightly songs, famous under the name *Vaux-de-Vire*, have given origin and name to the modern Vaudevilles.

**BASSELISSE TAPESTRY.** *See* HAUTELISSE.

**BASSES-ALPES** (bäs-âlp; "Lower Alps"). *See* ALPES.

**BASSES-PYRÉNÉES** (bäs-pē-rā-nā; "Lower Pyrenees"). *See* PYRÉNÉES.

**BASS'ET.** The name of a game at cards, formerly much played, especially in France. It is very similar to the modern *faro*. *See* LANSQUENET.

**BASSET,** or **BASSET-HOUND.** A smooth-haired dog with short crooked legs, rather large head, and large pendulous ears, thus somewhat resembling a bloodhound and a dachshund. It is sometimes used in packs for hunting hares, or in beating and covert work generally.

**BASSETERRE** (bäs-târ). Two towns in the West Indies.—1. Capital of the Island of St. Christopher's, at the mouth of a small river, on the south side of the island. Trade considerable. Pop. about 9000.—2. The capital of the Island of Guadeloupe. It has no harbour, and the anchorage is unsheltered and exposed to a constant swell. Pop. 8650.

**BASSET-HORN.** A musical instrument, now practically obsolete, a sort of clarinet of enlarged dimensions, with a curved and bell-shaped metal end. The compass extends from F below the bass staff to C on the second ledger-line above the treble. Mozart wrote several pieces for the basset-horn, and Beethoven employed it in his *Prometheus* overture.

**BASSETLAW.** A parliamentary division of the county of Nottingham.

**BASSIA.** A genus of tropical trees found in the East Indies and Australia, nat. ord., Sapotaceæ. The seeds of *B. butyracea*, the Indian butter tree, yield a butter-like substance, which makes good soap. *B. latifolia*, the Mahwa of Bengal, furnishes a valuable hard timber, and has edible flowers, from which a potent spirit is distilled; a gutta-percha is obtained from *B. pallida*.

**BASSO'ON.** A musical wind-instrument of the reed order, blown with a bent metal mouthpiece, and holed and keyed like the clarinet. Its compass comprehends three octaves rising from B flat below the bass staff. Its diameter at bottom is 3 inches, and for convenience of carriage it is divided into two or more parts, whence its Italian name, *fagotto*, a bundle. It serves for the bass among wood wind-instruments, as hautboys, flutes, etc.

**BASSORA GUM.** An inferior kind of gum resembling gum-arabic.

**BASS ROCK.** *See* Bass.

**BASS STRAIT.** A channel beset with islands, which separates Australia from Tasmania, 120 miles broad, discovered by George Bass, a surgeon in the Royal Navy, in 1798.

**BASSWOOD,** or **BASS.** The American lime tree or linden (*Tilia americāna*), a tree common in N. America, yielding a light, soft timber.

**BAST.** A term originally applied to fibrous tissue external to the cambium; now used in two senses: (1) for Phloem (q.v.); (2) commercially, for the fibre of the lime or linden. The manufacture of lime-bast into mats, ropes, etc., is in Russia a considerable industry, bast-mats for packing furniture, covering plants, etc., being largely exported.

**BASTAR'.** A feudatory State in Upper Godavari district, Central Provinces of India; area, 13,062 sq. miles; pop. 433,310. Chief town, Jagdalpur; pop. 4294.

**BASTARD.** A child begotten and born out of wedlock, an illegitimate child. By the civil and canon laws and the law of Scotland a bastard becomes legitimate by the intermarriage of his parents at any future time, and the Church in England in the early days of Parliament pressed, but in vain, for an enactment to the same effect. In England marriage was the only proof of fatherhood, and if that took place at any time, however short, before birth it was quite sufficient. It may here be observed that the Code Napoleon forbade research into paternity. But now by the Legitimacy Act, 1926, bastards become legitimate on the intermarriage of the parents provided that neither parent was married to a third person when the bastard was born. Apart from this statute a bastard is said to be *filius nullius*, and cannot be heir or next-of-kin to any one except his own issue.

In Scotland the bastard's maintenance is a joint burden on both parents. In England the mother may, before or within a year after the birth, take out an affiliation summons against the man she alleges to be the father for an order for the expenses of her confinement and a weekly payment for the maintenance of the child up to the age of 16, but no order is made unless her evidence is corroborated in some material particular.

**BASTARD BAR.** More correctly *baton sinister*, the heraldic mark used to indicate illegitimate descent. It is a diminutive of the bend sinister, of which it is one-fourth in width, couped or cut short at the ends, so as not to touch the corners of the shield.

**BASTARD FALLOW.** *See* FALLOW LAND.

**BASTARD SAFFRON.** *See* SAFFLOWER.

**BASTIA** (bȧs-tē'ȧ). The former capital of the Island of Corsica, upon the N.E. coast, 75 miles N.E. of Ajaccio, on a hill slope; badly built, with narrow streets, a strong citadel, and an indifferent harbour; with some manufactures, a considerable trade in hides, soap, wine, oil, pulse, etc. Pop. 29,412.

**BAS'TIAN, Adolf.** German traveller and ethnologist, born in 1826, died in 1905. His travels embraced various parts of Europe, the United States, Mexico, Peru, Australia and New Zealand, Southern and Western Africa, Egypt, Arabia, India, South-Eastern Asia, the Asiatic Archipelago, Japan, China, Mongolia, Siberia, etc. His numerous writings throw light on almost every subject connected with ethnology or anthropology, as well as psychology, linguistics, non-Christian religions, geography, etc. Some of his chief works are: *Die Völker des östlichen Asien*; *Ethnographische Forchungen*.

**BAS'TIAN, Henry Charlton.** English physician and biologist, born at Truro in 1837, died on 17th Nov., 1915. He was educated at Falmouth and at University College, London, where he was assistant curator in the museum from 1860 to 1863. He obtained the degree of M.A. in 1861 from the University of London, graduating subsequently in medicine at the same university (M.B. 1863, M.D. 1866). From 1864 to 1866 he was a medical officer in Broadmoor Criminal Lunatic Asylum, and in 1866 was appointed lecturer on pathology and assistant physician in St. Mary's Hospital. In 1867 he became professor of pathological anatomy in University College, subsequently he was also professor of clinical medicine, and in the period 1887-95 he occupied the chair of medicine and clinical medicine. Apart from numerous contributions to medical and other periodicals, and to Quain's *Dictionary of Medicine*, he published *The Modes of Origin of Lowest Organisms* (1871); *The Beginnings of Life* (1872); *Evolution and the Origin of Life* (1874); *Lectures on Paralysis from Brain Disease* (1875); *The Brain as an Organ of Mind* (1880), which has been translated into French and German; *The Nature and Origin of Living Matter*; *Evolution of Life*; *Origin of Life*, etc.

**BASTIAT** (bȧs-tē-ȧ), **Frédéric.** French economist, advocate of free-trade, and opponent of protection, born at Bayonne 1801, died at Rome 1850. He became acquainted with Cobden and the English free-traders, whose speeches he translated into French. Whilst combating protectionism, Bastiat was also an opponent of socialism. His chief works are: *Sophismes Économiques* (1846); *Propriété et Loi*; *Justice et Fraternité* (1848); *Protectionisme et Communisme* (1849); *Harmonies Économiques* (1849).

**BASTIEN-LEPAGE** (bȧs-tyaṇ-lē-pȧzh), **Jules.** French painter, born 1848, died 1884. He studied at Paris under Cabanel, and about 1874 began to attract some notice as a realistic painter of subjects connected with the country and everyday life, among his first pictures of note being *Song of Spring*, *Portrait of My Grandfather*, and *The First Communion*. Among his most important works are *The Hayfield*, *The Potato Harvest*, *Portrait of Mme. Sarah Bernhardt*, *The Beggar*, and *The Forge*.—Cf. Marie

Bashkirtsev, *Journal Intime*; Arnic, *J. Bastien-Lepage, lettres et souvenirs.*

**BASTILLE** (bàs-tēl'). A French name for any strong castle provided with towers, but as a proper name the State prison and citadel of Paris, which was built about 1370 by Charles V. It was ultimately used chiefly for the confinement of persons of rank who had fallen victims to the intrigues of the Court of the caprice of the Government. (*See* CACHET, LETTRES DE.) The capture of the Bastille by the Parisian mob, 14th July, 1789, was the opening act of the Revolution. On that date the Bastille was surrounded by a tumultuous mob, who first attempted to negotiate with the Governor, Delaunay, but when these negotiations failed, began to attack the fortress. For several hours the mob continued their siege without being able to effect anything more than an entrance into the outer court of the Bastille; but as last the arrival of some of the Royal Guard with a few pieces of artillery forced the Governor to let down the second drawbridge and admit the populace. The Governor was siezed, but on the way to the Hotel de Ville he was torn from his captors and put to death. The next day the destruction of the Bastille commenced. Not a vestige of it exists, but its site is marked by a column in the Place de la Bastille.—BIBLIOGRAPHY: François Ravaisson, *Les Archives de la Bastille*; Arnold, *Histoire de la Bastille*; Bingham, *The Bastille*; Funck-Brentano, *The Bastille*; M. J. de Staal, *La Bastille sous la Régence* (edited by Funck-Brentano).

**BASTINA'DO.** An Eastern method of corporal punishment, consisting of blows upon the soles of the feet, applied with a bamboo cane.

**BAS'TION.** In fortification, a large mass of earth, faced with sods, brick, or stones, standing out from a rampart, of which it is a principal part. A bastion consists of two *flanks*, each commanding and defending the adjacent *curtain*, or that portion of the wall extending from one bastion to another, and two *faces* making with each other an acute angle called the *salient angle*, and commanding the outworks and ground before the fortification. The distance between the two flanks is the *gorge*, or entrance into the bastion. The use of the bastion is to bring every point at the foot of the rampart as much as possible under the guns of the place.

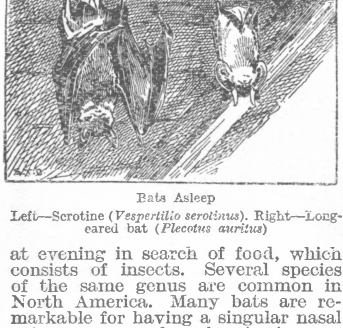
**BAST'WICK, John.** English physician and ecclesiastical controversialist, born in 1593, died 1654. He settled at Colchester, but, instead of confining himself to his profession, entered keenly into theological controversy, and was condemned by the Star Chamber for his books against Prelacy: *Elenchus Religionis Papisticæ, Flagellum Pontificis*, and *The Letanie of Dr. J. Bastwick*. With Prynne and Burton he was sentenced to lose his ears in the pillory, to pay a fine of £5000, and to be imprisoned for life. He was released by the Long Parliament, and entered London in triumph along with Prynne and Burton. He appears to have continued his controversies with the Independents and others to the very last.

**BASU'TOLAND.** A native province and British South African possession, situated between the Orange Free State, Natal, Griqualand East, and the Cape Province. The Basutos belong chiefly to the great stem of the Bechuanas, and have made greater advances in civilization than perhaps any other South African race. In 1866 the Basutos, who had lived under a semi-protectorate of the British since 1848, were proclaimed British subjects, their country placed under the government of an agent, and in 1871 it was joined to Cape Colony. In 1879 the attempted enforcement of an Act passed for the disarmament of the native tribes caused a revolt under the chief Moirosi, which the Cape forces were unable to put down. When peace was restored Basutoland was separated from Cape Colony (1884), and is now governed by a Resident Commissioner under the High Commissioner for South Africa.

Basutoland has an area of about 11,716 sq. miles, much of it covered with grass, and there is but little wood. The climate is pleasant. The natives keep cattle, sheep, and horses, cultivate the ground, and export grain. The Basuto ponies, which originally were brought from Batavia by the Dutch in the eighteenth century, are famous. It is divided into eight districts, each under a magistrate. Capital, Maseru. Pop. (European), 1396; (native), 497,385.—BIBLIOGRAPHY: J. Widdicombe, *Fourteen Years in Basutoland*; M. Martin, *Basutoland: Its Legends and Customs*; Sir G. Lagden, *The Basutos*; Rev. D. F. Ellenberger, *History of the Basuto.*

**BAT.** One of the group of winghanded, flying mammals, having the fore-limb peculiarly modified so as to serve for flight, and constituting the order Cheiroptera. Bats are animals of the twilight and darkness, and are common in temperate and warm regions, but are most numerous and largest in the tropics. All European bats are small, and have a mouse-like

skin. The body of the largest British species, *Vespertilio noctula*, is less than that of a mouse, but its wings stretch about 15 inches. During the day it remains in caverns, in the crevices of ruins, hollow trees, and similar lurking-places, and flits out



Bats Asleep

Left—Scrotine (*Vespertilio serotinus*). Right—Long-eared bat (*Plecotus auritus*)

at evening in search of food, which consists of insects. Several species of the same genus are common in North America. Many bats are remarkable for having a singular nasal cutaneous appendage, bearing in some cases a fancied resemblance to a horse-shoe. Bats may be conveniently divided into two sections—the insectivorous or carnivorous, comprising all European and most African and American species; and the fruit-eating, belonging to tropical Asia and Australia, with several African forms. An Australian fruit-eating bat (*Pteropus edulis*), commonly known as the kalong or flying-fox, is the largest of all the bats; it does much mischief in orchards. At least two species of South American bats are known to suck the blood of other mammals, and thence are called "vampire-bats."

Vampire-bat (*Phyllostroma spectrum*)

All the British bats belong to the insectivorous group, the fruit-eating and blood-sucking bats being confined to warmer regions. There are fifteen species on the British list, but of these three are very rare. Among the most noteworthy forms are the greater and the lesser horse-shoe bats, in which the ears are nearly as long as the whole body. As winter approaches, in cold climates bats seek shelter in caverns, vaults, ruinous and deserted buildings, and similar retreats, where they cling together in large clusters, hanging head downwards by the feet, and remain in a torpid condition until the returning spring recalls them to active exertions. Bats generally bring forth two young. The parent shows a strong degree of attachment to her offspring, and when they are captured, will follow them, and even submit to captivity herself rather than forsake her charge.

**BATAILLE, Henry.** French poet and dramatist, born at Nîmes in 1872. His first volume of poems, *La Chambre Blanche*, appeared in 1895. His other works include *Le Beau Rivage*, *Maman Colibri*, *La Marche Nuptiale*, *La Femme Nue*, *La Divine Tragédie*, etc. He died in 1922.

**BATALHA** (bà-tàl'yà). A village in Portugal, 69 miles north of Lisbon, with a renowned convent of Dominicans, a splendid building.

**BATAN'GAS.** A town of the Philippines, in the Island of Luzon, capital of a province of same name, 58 miles south of Manila. Pop. 33,131.

**BATA'TAS.** *See* SWEET-POTATO.

**BAT'AVI.** *See* BATAVIANS.

**BATA'VIA.** A city and seaport of Java, on the north coast of the island, the capital of the Dutch East Indies. It is situated on a wide, deep bay, the principal warehouses and offices of the Europeans, the Java Bank, the exchange, etc., being in the old town, which is built on a low, marshy plain near the sea, intersected with canals and very unhealthy; while the Europeans reside in a new and much healthier quarter. Batavia has a large trade, sugar being the chief export. It was founded by the Dutch in 1619, and attained its greatest prosperity in the beginning of the eighteenth century. Its inhabitants are chiefly Malay, with a considerable admixture of Chinese and a small number of Europeans. Pop. 234,697.

**BATAVIAN REPUBLIC.** *See* BELGIUM; NETHERLANDS.

**BATAVIANS.** An old German nation which inhabited a part of the present Holland, especially the island called *Batavia*, formed by that branch of the Rhine which empties itself into the sea near Leyden, together with the Waal and the Meuse. Tacitus asserts that they were a branch of the Catti. They were subdued by Germanicus, and were granted special privileges for their faithful services to the

Romans, but revolted under Vespasian. They were, however, again subdued by Trajan and Adrian, and at the end of the third century the Salian Franks obtained possession of the Island of Batavia.

**BATCHIAN.** *See* BACHIAN.

**BATES, Henry Walter.** Traveller and naturalist, born at Leicester 1825, learned the hosiery trade, but in 1847 went to the Amazon with Russel Wallace, and remained there for eleven years studying the natural history of the region. Returning to England, he published in 1862 his *Naturalist on the River Amazons*, a work regarded as a classic. He was assistant secretary to the Royal Geographical Society from 1864 till his death in 1892. A large part of his collections is in the British Museum.

**BATH** (bâth). A city of England, in Somersetshire, on the Avon, which is navigable for barges from Bristol; is beautifully placed among the hills, and the houses are built of freestone, obtained from the neighbourhood. The Abbey Church, dating from the fifteenth century, ranks as one of the finest specimens of Perpendicular Gothic architecture. Bath is remarkable for its medicinal waters, the four principal springs yielding no less than 184,000 gallons of water a day; and the baths are both handsome and roomy. The temperature of the springs varies from 109° to 117° F. They contain carbonic acid, chloride of sodium and of magnesium, sulphate of soda, carbonate and sulphate of lime, etc. Bath was founded by the Romans, and called by them *Aquæ Solis* (Waters of the Sun). Amongst the Roman remains discovered there have been some fine baths. The height of its prosperity was reached, however, in the eighteenth century, when Beau Nash was leader of the fashion and master of its ceremonies. Since then, though it still attracts large numbers of visitors, it has become the resort of valetudinarians chiefly. Jointly with Wells it is the head of a diocese, and since 1918 returns one member to the House of Commons. Pop. (1931), 68,801.

**BATH.** A town, United States, Maine, on the west side and at the head of the winter navigation of the Kennebec, 12 miles from the sea. Chief industries: shipbuilding and allied crafts. Pop. 9396.

**BATH.** The immersion of the body in water, or an apparatus for this purpose.

**Ancient Baths.** The use of the bath as an institution, apart from occasional immersion in rivers or the sea, is, as might be anticipated, an exceedingly old custom. Homer mentions the bath as one of the first refreshments offered to a guest; thus, when Ulysses enters the palace of Circe, a bath is prepared for him, and he is anointed after it with costly perfumes. No representation, however, of a bath as we understand it is given upon the Greek vases, bathers being represented either simply washing at an elevated basin, or having water poured over them from above.

In later times, rooms, both public and private, were built expressly for bathing, the public baths of the Greeks being mostly connected with the gymnasia. Apparently, by an inversion of the later practice, it was customary in the Homeric epoch to take first a cold and then a hot bath; but the Lacedæmonians substituted the hot-air sudorific bath, as less enervating than warm water, and in Athens at the time of Demosthenes and Socrates the warm bath was considered by the more rigorous to be an effeminate custom. The fullest details we have with respect to the bathing of the ancients apply to its luxurious development under the Romans. Their bathing establishments consisted of four main sections: the undressing room, with an adjoining chamber in which the bathers were anointed; a cold room with provision for a cold bath; a room heated moderately to serve as a preparation for the highest and lowest temperatures; and the sweating-room, at one extremity of which was a vapour-bath and at the other an ordinary hot bath.

After going through the entire course both the Greeks and Romans made use of strigils or scrapers, either of horn or metal, to remove perspiration, oil, and impurities from the skin. Connected with the baths were walks, covered race-grounds, tennis-courts, and gardens, the whole, both in the external and internal decorations, being frequently on a palatial scale. The group of the *Laocoon* and the *Farnese Hercules* were both found in the ruins of Roman baths.

**Modern Baths.** With respect to modern baths, that commonly in use in Russia consists of a single hall, built of wood, in the midst of which is a powerful metal oven, covered with heated stones, and surrounded with broad benches, on which the bathers take their places. Cold water is then poured upon the heated stones, and a thick, hot steam rises, which causes the sweat to issue from the whole body. The bather is then gently whipped with wet birch rods, rubbed with soap, and washed with lukewarm and cold water; of the latter, some pailfuls are poured over his

head; or else he leaps, immediately after this sweating-bath, into a river of pond, or rolls in the snow.

The Turks, by their religion, are obliged to make repeated ablutions daily, and for this purpose there is, in every city, a public bath connected with a mosque. A favourite bath among them, however, is a modification of the hot-air sudorific bath of the ancients introduced under the name of "Turkish" into other than Mahommedan countries. A regular accompaniment of this bath, when properly given, is the operation known as "kneading," generally performed at the close of the sweating process, after the final rubbing of the bather with soap, and consisting in a systematic pressing and squeezing of the whole body, stretching the limbs, and manipulating all the joints as well as the fleshy and muscular parts. Public baths are now common in Europe, but the first English public baths and wash-houses of the kind now common in all cities were established in Liverpool and near the London docks in 1844. In 1846 an Act was passed for their encouragement, and a series of statutes, known as "The Baths and Wash-houses Acts 1846 to 1896," followed. The establishment of cheap swimming-baths was authorized in 1878.

The principal natural warm baths in England are at Bath, in Somersetshire (the hottest), and Buxton and Matlock, in Derbyshire. The temperature of the Bath springs ranges from 109° to 117° F., while that of the Buxton and Matlock waters scarcely exceeds 82°. The baths of Harrogate, which are strongly impregnated with sulphuretted hydrogen gas, are also of great repute for the cure of obstinate cutaneous diseases, indurations of the glands, etc. The most celebrated natural hot baths in Europe are those of Aix-la-Chapelle, and the various Baden, in Germany; Toeplitz, in Bohemia; Bagnières, Barèges, and Dax, in the south of France; and Spa, in Belgium. Besides the various kinds of water-bath with or without medication or natural mineral ingedients, there are also milk, oil, wine, earth, sand, mud, and electric baths, smoke-baths and gas-baths; but these are as a rule only indulged in after specific prescription.

The practice of bathing as a method of cure in cases of disease falls under the head of hydropathy; but even when it is employed simply for pleasure or purification due regard should be paid to the physiological condition of the bather. In many cases cold bathing should be avoided altogether, especially by those who have any tendency to spitting of blood or consumption, by gouty people, or by those who have any latent visceral disease or apoplectic tendency. Wherever the bath is followed by shivering instead of by a healthy reactionary glow, it is undesirable; and a cold bath in the morning after any debauchery or excess in eating or drinking on the previous evening is exceedingly imprudent.

Delicate persons and children ought not to bathe in the sea before ten or eleven o'clock in the morning, and in no case should bathing be indulged in after a long fast. In cold streams and rivers additional precautions should be taken, the cold plunge, when heated or fatigued, being frequently attended with fatal results. Even warm baths are not wholly free from danger; apoplexy and death having been known to follow a hot bath when entered with a full stomach. As a rule the temperature should not exceed 105°, and they should not be too long continued. Frequent indulgence in them has an enervating effect, though the majority of people need as yet no renewal of Hadrian's prohibitive legislation in this matter. *See also* DOUCHES; THERMÆ.—BIBLIOGRAPHY: W. A. Becker, *Gallus*; J. Farrar, *Baths and Bathing*; W. P. Gerhard, *Modern Baths and Bath Houses*; R. F. Fox, *Principles and Practice of Medical Hydrology*.

**BATH, Knights of the.** An order of England, supposed to have been instituted by Henry IV. on the day of his coronation, but allowed to lapse after the reign of Charles II. till 1725, when George I. revived it as a military order. By the book of statutes then prepared the number of knights was limited to the sovereign and thirty-seven knights companions; but the limits of the order were greatly extended in 1815, and again in 1847, when it was opened to civilians. It now consists of three classes, each subdivided into (1) military members, (2) civil members, and (3) honorary members, consisting of foreign princes and officers. The first class consists of Knights of the Grand Cross (G.C.B.); the second of Knights Commanders (K.C.B.); and the third of Companions (C.B.). The Dean of Westminister is dean of the order.

In 1917 the Companions of the order were given the privileges and precedence of Commanders, the badge being now worn round the neck. In 1918 the statutes were amended in order to admit officers of the Royal Air Force to the military division. The ribbon of the order is crimson; the military badge a gold cross of eight points, with the lion of England

between the four principal angles, and having in a circle in the centre the rose, thistle, and shamrock between three imperial crowns; motto: *Tria juncta in uno*. Stars are worn by the two first classes, with additional motto, *Ich dien*, for the military members only. *See* KNIGHTHOOD.

**BATH-BRICK.** A preparation of siliceous earth found in the River Parret, in Somersetshire, in the form of a solid brick, used for cleaning knives, etc. *See* SAND.

**BATH'GATE.** A town, Scotland, Linlithgowshire, pleasantly situated, and having in the vicinity the paraffin works known as Young's, a paper-mill and other works, and coal and iron-stone mines. Pop. (1931), 10,097.

**BATHOLITE.** A mass of igneous rock having no visible floor, and presumed to pass down into some region of the earth's crust where molten rocks at one time prevailed over all others. Granite blocks, like those of the Cairngorm Mountains in Scotland, or the long ridge of the Leinster Chain, which have intruded into their surroundings, are regarded as batholites the crests of which have become exposed by denudation. A batholite in its original molten condition may exist under any large area of volanic activity, and the similarity of the igneous rocks sent to the surface over broad regions of the earth, constituting what are called "petrographical provinces," points to the existence of very considerable continuous rock-cauldrons in the crust.

**BATHOM'ETER.** An instrument, invented by Sir William Siemens, for measuring the depth of sea beneath a vessel without casting a line. It is based upon the fact that the attraction exerted upon any given mass of matter on the ship is less when she is afloat than ashore, because of the less density of sea-water as compared with that of earth or rock.

**BATHONIAN STAGE.** A division of the middle Jurassic series of rocks, including the beds between the Inferior Oolite and the Oxford Clay. The name is derived from its excellent development near Bath, in Somersetshire, and the most important member is the Oolitic limestone known as Bath-stone (q.v.). The Bathonian stage includes the following beds in ascending order:

1. *Stonesfield Slate*, named from a village near Woodstock; a flaggy limestone used for roofing, with remains of ferns and cycads washed in from the Jurassic land, and of some of the earliest-known mammals, allies of the monotremes or the marsupials. 2. The *Great* or *Bath Oolite*, with marine fossils, and also remains of the large reptiles known as dinosaurs. 3. *Bradford Clay*. 4. *Forest Marble*. 5. *Cornbrash*, so called from its "brashy" or rubbly nature, an earthy oolite yielding fair land for corn.

**BATHORI** (bä'to-rē), or **BATHORY.** A Hungarian family, which gave Transylvania five princes, and Poland one of its greatest kings. The more important members were:—1. Stephen, born in 1532, elected Prince of Transylvania in 1571, on the death of Zapolya, and in 1575 King of Poland. He accomplished many internal reforms, recovered the Polish territories in possession of the Czar of Moscovy, and reigned prosperously till his death in 1586.—2. Sigismund, nephew of Stephen, educated by the Jesuits, became Prince of Transylvania in 1581, shook off the Ottoman yoke, and had begun to give hopes of reigning gloriously when he resigned his dominions to the Emperor Rudolph II., in return for two principalities in Silesia, a cardinal's hat, and a pension. Availing himself, however, of an invitation by the Transylvanians, he returned, and placed himself under the protection of the Porte, but was defeated by the Imperialists in every battle, and finally sent to Prague, where he died almost forgotten in 1613.—3. Elizabeth, niece of Stephen, King of Poland, and wife of Count Nadasdy, of Hungary. She is said to have bathed in the blood of 600 young girls in the hope of renewing her youth, and to have committed other enormities. She was afterwards seized and confined till her death in 1614.

**BAT-HORSE.** *See* BATMAN.

**BA'THOS.** A Greek word meaning depth, now used to signify a ludicrous sinking from the elevated to the mean in writing or speech. First used in this sense by Pope in *The Art of Sinking in Poetry* (*Scriblerus Papers*, 1729).

**BATH-STONE** (also called **BATH-OOLITE** and **ROE-STONE**, from the small rounded grains of which it is composed). A species of English limestone. It is extensively worked near Bath for building purposes. When just quarried it is soft; but though it soon becomes hard on exposure to the atmosphere, and is of handsome appearance, it is not very durable.

**BATH'URST.** A British settlement on the west coast of Africa, on the island of St. Mary's, near the mouth of the Gambia, with a trade in gum, bees-wax, hides, ivory, gold, rice, cotton, and palm oil. Pop. 8000.

**BATHURST.** A town in the western district of New South Wales, on the Macquarie River, with wide, well-laid-out streets at right angles, and a central square, tanneries, railway workshops, breweries, flour-mills, and other industries. Pop. 9200.

**BATHURST, Allen Bathurst.** First Earl, a distinguished statesman in Queen Anne's reign; born 1684. He took part with Harley and St. John in opposing the influence of Marlborough, was raised to the peerage in 1711, impeached the promoters of the South Sea scheme, opposed the Bill against Atterbury, and was a leading antagonist of Walpole. He was created earl in 1772. His name is also associated with those of the leading writers and wits of the day. Died 1775.

**BATHURST, Henry Bathurst.** Third Earl, son of the second earl, a prominent Tory statesman, after whom various capes, islands, and districts were named. Born 1762; in 1807, President of Board of Trade; in 1809, Secretary for Foreign Affairs; and in 1812, Secretary for the Colonies, a post held by him for sixteen years. He was also President of the Council under Wellington, 1828-30. Died 1834.

**BATHURST ISLAND.** On the North Australian coast, belonging to S. Australia, separated from Melville Island by a narrow strait; triangular in shape, with a wooded area of about 1000 sq. miles.—Also an island in the Arctic Ocean discovered by Parry, E. of Cornwallis and W. of Melville Island, 76° N., 100° W.

**BATHYBʹIUS** (Gr. *bathys*, deep, *bios*, life). The name given by Huxley to what was regarded as granular, slimy masses of animal matter found covering the sea bottom at great depths.

**BATIK.** A process of dyeing fabric to produce marble colour effects. The material is immersed in different coloured dyes successively, the parts to remain unaffected in each stage being covered by hot wax. The name is also applied to the fabric so treated, and the design produced by this method.

**BATʹLEY.** Municipal and parliamentary borough of England, West Riding of York, about a mile from Dewsbury; principal manufactures: heavy woollen cloths, such as pilot, beaver, police, army, and frieze cloths, flushings and blankets. Batley and Morley unite in returning one member to Parliament. Pop. (1931), 34,573.

**BATMAN** (batʹman or băʹman; from Fr. *bât*, a pack-saddle). In the British army, a person allowed by the Government to every company of a regiment on foreign service. His duty is to take charge of the cooking utensils, etc., of the company, and he has a bat-horse to convey these utensils from place to place.

**BAʹTON.** A short staff or truncheon, in some cases used as an official badge, as that of a field-marshal. The conductor of an orchestra has a baton for the purpose of directing the performers as to time, etc. In heraldry, what is usually called the "bastard bar," or "bar sinister," is properly a baton sinister. *See* BASTARD BAR.

**BATʹON ROUGE** (rözh). The capital of Louisiana, United States, on the left bank of the Mississippi, with an arsenal, barracks, military hospital, State house, State university, etc. On 5th Aug., 1862, the Confederates under General Breckenridge suffered a severe defeat before it. Pop. 21,782.

**BATOUM,** or **BATUM** (bå-törmʹ). A port on the east coast of the Black Sea, acquired by Russia by the Treaty of Berlin, on condition that its fortifications were dismantled and it was thrown open as a free port. It rapidly grew to be the main outlet for Transcaucasia; its harbour was enlarged for commercial reasons; an arsenal was built outside it; it was connected by a military road with Kars; and finally, in July, 1886, the Russian Government declared it to be a free port no longer. Its importance as a naval and military station to Russia was unquestionably great; it is of most importance commercially as an outlet for the mineral oil of Baku. The water is of great depth close inshore, and the shipping lies under protection of the overhanging cliffs of the Gouriel Mountains. Batoum was abandoned by the Bolshevik Government in March, 1918, and occupied by the Turks on 15th April of the same year. By the terms of the armistice concluded with Turkey in Nov., 1918, the Allies occupied the port, and in Nov., 1919, a military governor was appointed by the British Government. On 9th July, 1920, Batoum was evacuated by the British, and occupied by Georgian troops. Pop. 46,000.—The province of *Batoum* had an area of 2693 sq. miles. Pop. 186,000.

**BATRACHIANS** (ba-trāʹki-anz; Gr. *batrachos*, a frog). The fourth order in Cuvier's arrangement of the class Reptilia, comprising frogs, toads, newts, salamanders, and sirens. The term is now sometimes employed as synonymous with amphibia, but is

more usually restricted to the order Anura or tailless amphibia. *See* AMPHIBIA.

**BATSHIAN.** *See* BACHIAN.

**BAT'TA.** An allowance which military officers in India receive in addition to their pay. It was originally given only when the officers were on the march or in the field, but now half-batta is paid when troops are in cantonments.

**BATTAL'ION.** The tactical unit of command in infantry, supposed to be of the maximum strength to be efficiently handled by one officer in chief command, with others under him. In most armies it is about 1000 to 1100 men. The former is about the strength of a battalion in the British army, in which battalions now correspond to what were formerly regiments, the chief commanding officer (in actual command) being the lieutenant-colonel. *See* ARMY.

**BATTALION OF DEATH.** The legion of Russian women and girls, belonging to all classes, organized in 1917 and commanded by the famous revolutionary Madame Botshkalova. The battalion took part in several engagements.

**BAT'TAS,** or **BATTAKS.** A people belonging to the Malayan race inhabiting the valleys and plateaus of the mountains that extend longitudinally through the Island of Sumatra. They practise agriculture and cattle-rearing, and are skilful in various handicrafts; they have also a written literature and an alphabet of their own, their books treating of astrology, witchcraft, medicine, war, etc. They are under the rule of hereditary chieftains. In 1908 a Battak Institute was established at Leyden for the study of the Battak country, people, etc.

**BAT'TENBERG.** A village in the Prussian province of Hesse-Nassau, from which the sons (by morganatic marriage) of Prince Alexander of Hesse, uncle of Louis, Grand-Duke of Hesse, the husband of Princess Alice of Britain, derived their titles of princes of Battenberg. One of them, Alexander, was Prince of Bulgaria from 1879 to 1886, and died in 1893. Another, Prince Henry, was married to Princess Beatrice of Great Britain in 1885, and died in 1896.

**BATTENBERG, Prince Louis Alexander of.** Born 24th May, 1854, in Graz, son of Prince Alexander of Hesse. He became a naturalized British subject, entered the navy in 1868, and in 1884 married Princess Victoria, eldest daughter of Princess Alice Maud, Grand-Duchess of Hesse-Darmstadt, and second daughter of Queen Victoria. He became rear-admiral in 1904, was second admiral of the Mediterranean fleet from 1906 to 1908, commanded the Atlantic fleet from 1908 to 1910, the 3rd and 4th divisions of the Home fleet in 1911, and was appointed Second Sea Lord in Nov., 1911, and First Sea Lord in Dec., 1912, in succession to Sir Francis Bridgeman.

In October, 1914, however, in consequence of a campaign against alien enemies which culminated in an attack in the *Globe* on the First Sea Lord, he tendered his resignation to Mr. Winston Churchill, then First Lord of the Admiralty, on the ground that his birth and parentage in some respects impaired his usefulness. In 1917 the king determined that those princes of his family who were his subjects and bore German names and titles should relinquish those titles and adopt British surnames, and Prince Louis adopted the title of Marquess of Milford Haven, and the surname of Mountbatten. He was the author of *Men-of-war Names, their Meaning and Origin* (1908). He was made a Privy Councillor in 1914, and was both a Civil and a Military Knight Grand Cross of the Bath. He died 11th Sept., 1921.

**BATTERING-RAM.** An engine for battering down the walls of besieged places. The ancients employed two different engines of this kind—one suspended in a frame, the other movable on wheels or rollers. They consisted of a beam or spar with a massive metal head, and were set in motion either by a direct application of manual force or by means of cords passing over pulleys. Some are said to have been 120 feet or more in length, and to have been worked by 100 men. One is described as being 180 feet long, and having a head weighing 1½ tons. Smaller ones, manned by three or four soldiers, were also frequently employed. They were generally covered with a roof or screen for the protection of the workers. The battering-ram is mentioned by Ezekiel (iv. 2; xxi. 22), and the Romans learnt the use of it from the Greeks.

**BAT'TERSEA.** A municipal and parliamentary borough of London, in Surrey, in a low situation on the south bank of the Thames, nearly opposite Chelsea, with a fine public park extending over 185 acres. The district is associated with the names of Pope and Bolingbroke, and with the Wellington-Winchilsea duel. Battersea returns two members to Parliament. Pop. (municipal borough), (1931), 159,542.

**BAT'TERY.** (1) Any number of guns grouped for action in one place and under one control; (2) the tactical and administrative unit of the Royal Regiment of Artillery; (3) an entrenched work constructed as a position for guns in siege warfare.

The Royal Regiment of Artillery is organized in batteries of horse, field, heavy, siege, and mountain artillery. These differ in the weight and type of gun with which they have to do, but the general principles of organization are the same. (*See* ARMY.) Nominally a battery consists of six guns with their attendant ammunition wagons (12) and certain other transport. A major commands the battery, and has a captain and three subalterns to assist him. For all purposes a battery is permanently organized in three sections, each of two guns and four wagons, under subaltern officers; while in action it is divided into two parts, (*a*) the fighting battery of six guns and six wagons; (*b*) the wagon line of the remaining wagons, under command of the captain. The change from march formation to that necessary for firing is termed "coming into action."

Horse, field, and some heavy batteries are horse-drawn (six or eight horses to a gun), while other heavy batteries and siege-guns are drawn by mechanical transport or mounted on railway platforms. Mountain batteries are organized for pack transport only—either mules or carriers—all the material being specially constructed to this end. Among combinations with the word battery come the following: *battery commander*, the officer commanding a battery; *battery leader*, the senior subaltern, who receives and carries out the commander's orders in action; *battery-fire*, each gun of a battery firing in turn: as opposed to gun-fire, where each gun fires independently. *See* ARTILLERY.

Roman Battering-ram

**BATTERY.** In criminal law, an assault by beating or wounding another. The least touching or meddling with the person of another against his will may be held to constitute a battery.

**BATTERY.** In electricity and galvanism, a combination of several jars or metallic plates. *See* DANIELL'S CELL; ELECTRIC BATTERY; SECONDARY CELL.

**BATTHYANYI** (bât-yân'yē). One of the oldest and most celebrated Hungarian families, traceable as far back as the Magyar invasion of Pannonia in the ninth century. Among later bearers of the name have been—Count Casmir Batthyanyi, who was associated with Kossuth, was Minister of Foreign Affairs in Hungary during the insurrection of

1849, and died in Paris 1854; Count Louis Batthyanyi, born 1809, of another branch of the family, was leader of the opposition in the Hungarian Diet until the breaking out of the commotions of 1848, when he took an active part in promoting the national cause; but on the entry of Windischgrätz into Pesth he was arrested and shot, 1849.

**BATTLE.** A combat between two armies. In ancient times and the Middle Ages the battle-ground was often chosen by agreement, and the battle was a mere trial of strength, a duel *en gros*; and as the armies of the ancients were imperfectly organized, and the combatants fought very little at a distance, after the battle had begun manœuvres were much more difficult, and troops almost entirely beyond the control of the general. Under these circumstances the battle depended almost wholly upon the previous arrangements and the valour of the troops. In modern times, however, the finest combinations, the most ingenious manœuvres, are rendered possible by the better organization of the armies, and it is the skill of the general rather than the courage of the soldier that now determines the event of a battle. Battles are distinguished as *offensive* or *defensive* on either side, but there is a natural and ready transition from one method to the other. The purely defensive attitude is condemned by tacticians except in cases where the only object desirable is to maintain a position of vital consequence, the weight of precedent being in favour of the dash and momentum of an attacking force even where opposed to superior forces. Where the greatest generals have acted upon the defensive, it has almost always been with the desire to develop an opportunity to pass to the offensive, and, having discovered their opponent's hand, to marshal against the enemy, exhausted with attack, the whole strength of their resources. Napoleon won more than one great victory by this method, and Wellington's reputation was largely based upon his skill in defensive-offensive operations. Tacticians have divided a battle into three periods, which are disposition, combat, and the decisive moment. In some measure they require distinct qualities in a commander, the intellect which can plot a disposition being by no means always of the prompt judgment passing to instant action which avails itself of the crucial moment to crush an enemy.

Co-operation and mutual support of all arms and services is essential to success in a modern battle, which may occupy many days or even weeks and embrace a large area of country, e.g. the battle of the Marne, the battle of the Somme. This co-operation is ensured by the most careful and detailed arrangements being made beforehand, such arrangements even including the rehearsal of more important phases over ground prepared to represent the country over which the operations will eventually take place. The modern battle may be, and probably will be, a continuation of many operations—*offensive* and *defensive*—carried out by distinct and separate formations. The general scope of the operations as a whole will be planned by the supreme commander, while the choice of the methods to be used is left to the commander of the formations affected. *See* STRATEGY; TACTICS.

**BATTLE.** A town in Sussex, so named from the battle of Hastings having been fought there. An abbey built by William the Norman has disappeared, but important remains of a later building exist on the same site; and there is an old church of great interest. Pop. (1931), 3490.

**BATTLE** (or **BATTEL**), **Wager of.** An obsolete method, according to English law, of deciding civil or criminal cases by personal combat between the parties or their champions in presence of the court. A woman, a priest, a peer, or a person physically incapable of fighting could refuse such a trial. It was not abolished till 1819 (by the Statute of 59 George III., c. 46), but had long previously been in abeyance. *See* ORDEAL.

**BATTLE-AXE.** A weapon much used in war in the early part of the Middle Ages among knights. It is a weapon which affords hardly any guard, and the heavier the blow given with it the more the fighter is exposed; but its use was to some extent necessitated by the resistance of iron armour to all but heavy blows. In England and Scotland the battle-axe was much employed, the Lochaber-axe remaining a formidable implement of destruction in the hands of the Highlanders to a recent period.

**BATTLE CREEK.** A town of the United States, in Michigan, at the junction of the Kalamazoo and Battle Creek, with a college, and manufactures of agricultural implements, etc. Pop. 25,267.

**BATTLEFORD.** A trading town of Canada, province of Saskatchewan, at the junction of the Battle and Saskatchewan (North Fork). Pop. 1335.

**BATTLEMENT.** A notched or indented parapet of a fortification, formed by a series of raised parts

called *cops* or *merlons*, separated by openings called *crenelles* or *embrasures*, the soldier sheltering himself behind the merlon, while he fires through the embrasure. Battlements were originally military, but were afterwards used freely in ecclesiastical and civil buildings by way of ornament, on parapets, cornices, tabernacle work, etc.

**BATTLESHIP.** Ship used for purposes of warfare. In practice the word is confined to the largest ships in the fleet. These are the successors of the ships of the line which composed the striking force of fleets in the days of Nelson, and also of the triremes of the Greeks and the galleys of the Romans. The modern battleship, costing some £6,000,000, is a structure of remarkable strength, size and speed, perhaps the most wonderful piece of mechanism yet devised by science.

The first modern battleship dates from about 1862. In 1863 the British Government launched ironclads with turrets and from these the present ships have developed. They became larger, swifter and stronger, carrying more and heavier guns. The *Royal Sovereign*, launched in 1890, was one of a class that prepared the way for the Dreadnoughts. The innovation about these ships was that they were armed only with big guns, except for the small ones used to repel torpedo attacks. They displaced 17,900 tons and carried 12 in. guns. The *Iron Duke* class, their successors, carried 13.5 in. guns and displaced 23,600 tons, while the *Queen Elizabeths* carried 15 in. guns and displaced 27,000 tons. Such were the superdreadnoughts which formed the nucleus of the Grand Fleet in the Great War.

To-day (1932) there are four classes of battleships in the British navy. Three of these are the *Queen Elizabeths*, the new *Royal Sovereigns*, also with 8.15 in. guns, and the *Iron Dukes* with 10 13.5 in. guns. The latter two classes are slightly smaller than the *Queen Elizabeths*. The fourth class consists of the *Rodney* and the *Nelson*, completed in 1927. They displace 35,000 tons and carry 9 16 in. guns.

Other navies have similar ships, but the Germans have constructed a pocket battleship of only 10,000 tons, which, it is claimed, is equal in power to a super-dreadnought. In 1923, by the Treaty of Washington, a life of 20 years was allowed for battleships.

**BATTUE** (ba-tü'). A method of killing game by having persons to beat a wood, copse, or other cover, and so drive the animals (pheasants, hares, etc.) towards the spot where sportsmen are stationed to shoot them.

**BATTUS.** Legendary founder of the Greek colony of Cyrene, in Libya, about 650 B.C. There were eight rulers of the family founded by him, bearing alternately the names Battus and Arcesilaus.

**BATU KHAN.** Mongol ruler of the Western conquests of his grandfather, Genghis Khan, from 1224 to 1255. He overran Russia, Poland, Hungary, and Dalmatia, holding Russia for ten years.

**BATUM.** *See* BATOUM.

**BAUDELAIRE** (bōd-lār), **Charles Pierre.** French poet, born 1821. His first work of importance was a series of translations from Poe, ranking among the most perfect translations in any literature. A volume of poems, *Les Fleurs du Mal* (1857), established his reputation as a leader of the Romanticists, though the police thought it necessary to deodorize them. Of a higher tone were his *Petits Poèms en Prose*; followed in 1859 by a monograph on Théophile Gautier, in 1860 by *Les Paradis Artificiels* (opium and hashish studies), and in 1861 by *Wagner et Tannhäuser à Paris*. He died in 1867. The best English rendering of the *Fleurs du Mal* is by A. Symons (1905). —BIBLIOGRAPHY: Henry James, *French Poets and Novelists*; Asselineau, *Charles Baudelaire, sa vie et son œuvre*; F. Gautier, *Charles Baudelaire*.

**BAUDRY** (bō-drē), **Paul Jacques Aimé.** A prominent modern French painter, born in 1828, died Jan., 1886. He took the grand prix de Rome in 1850, and exhibited many important works, of which the better known are his *Charlotte Corday* and *La Perle et la Vague*. The decoration of the *foyer* of the New Opera House at Paris was entrusted to him—an enormous work, occupying a total surface of 500 sq. metres, but admirably accomplished by him in eight years.

**BAUER** (bou'er), **Bruno.** German philosopher, historian, and Biblical critic of the rational school, born 1809, died 1882. Wrote *Critique of the Gospel of John* (1840); *Critique of the Synoptic Gospels* (1840); *History of the French Revolution to the Founding of the Republic* (1847); *History of Germany during the French Revolution and the Rule of Napoleon* (1846); *Critique of the Gospels* (1850-1); *Critique of the Pauline Epistles* (1850); *Philo, Strauss, Renan, and Primitive Christianity* (1874); *Christ and the Cæsars* (1877), etc.

**BAUHIN** (bō-aṇ), **Gaspard.** Born

at Basel in 1560; in 1580 elected to the Greek chair at Basel, and in 1589 to that of anatomy and botany. He died in 1624. His fame rests chiefly on his *Pinax Theatri Botanici* and *Theatrum Botanicum*. Linnæus gave his name to a genus of plants.

**BAUHIN'IA.** A genus of plants, ord. Leguminosæ, usually lianes, found in the woods of hot countries, and often stretching from tree to tree like cables. Many are showy and interesting. The bark of *B. variegāta* is used in tanning; the bast fibres of some Indian species are made into ropes and twine.

**BAUMGARTEN** (boum'gär-tn), **Alexander Gottlieb.** A German philosopher, born in 1714 at Berlin; in 1740 was made professor of philosophy at Frankfort-on-the-Oder, and died there in 1762. He is the founder of æsthetics as a science, and the inventor of this name. His ideas were first developed in his *De Nonnullis ad Poema pertinentibus* (1735), and afterwards in the two volumes of his uncompleted *Æsthetica*, published 1750-8.

**BAUR** (bour), **Ferdinand Christian.** German theologian, founder of the "Tübingen School" of theologians and Hegelian thinkers, born in 1792. The publication of his first work, *Symbolism and Mythology, or The Natural Religion of Antiquity*, in 1824-5, led to his appointment as professor in the evangelical faculty of Tübingen University, a position occupied by him till his death in 1860. His chief works in the department of the history of Christian dogma are: *The Christian Gnosis, or The Christian Philosophy of Religion* (1835); *The Christian Doctrine of the Atonement* (1838); *The Christian Doctrine of the Trinity and the Incarnation* (1841-3); *The Compendium of and Lectures on the History of Christian Dogmas* (1847, 1865). To the department of New Testament criticism and the early history of Christianity belong *The so-called Pastoral Epistles of the Apostle Paul* (1835); *Paul the Apostle of Jesus Christ* (1845); *Critical Inquiries Concerning the Canonic Gospels* (1847); *A History of Christian Doctrine to the End of the Eighteenth Century* (1853-63).

Baur's views in regard to the Church of the earliest times and the New Testament Scriptures have been very influential. He saw different and opposing tendencies at work in the Church of apostolic times, and believed that the New Testament mainly took form in the second century, the only genuine writings previous to A.D. 70 being the four great Pauline epistles and *Revelation*.

**BAUTZEN** (bout'sen), or **BUDISSIN.** A German town in Saxony, upon a height on the right bank of the Spree, with some old and interesting buildings. The inhabitants are mostly Lutheran, and both Catholics and Protestants worship in the same cathedral. Chief manufactures: woollen goods, paper, gunpowder, machines. Napoleon defeated the united armies of the Russians and the Prussians at Bautzen on the 21st May, 1813. Pop. 38,334.

**BAUXITE** (bąk'sīt). A rock resembling clay, but consisting of hydrated aluminium oxide, with, in good examples, a silica content of less than 2 per cent. Bauxite is mined at Les Baux in Provence, in Arkansas, and other places, including County Antrim, where it occurs between basaltic lavas. It is the source of commercial aluminium, and is also used for bricks for high-temperature furnaces, and in alum manufacture. Like laterite (q.v.), it results from tropical conditions of weathering acting on a variety of silicate rocks.

**BAVA'RIA** (Ger. *Bayern*; Fr. *Bavière*). Previous to the changes caused by the European War, a kingdom in the south of Germany, now a republic in the German federation, composed of two isolated portions, the larger comprising about eleven-twelfths of the total area, having Württemberg, Baden, etc., on the west, while the smaller portion, the Pfalz or Palatinate, is separated from the other by Württemberg and Baden, and lies west of the Rhine; total area, 29,334 sq. miles. The main political divisions are: Upper Bavaria (pop. 1,684,766; chief town, Munich, the capital of the country, pop. 680,704); Lower Bavaria (755,769); Palatinate (931,755); Upper Palatinate and Regensburg (629,262); Upper Franconia (757,515); Middle Franconia (998,386); Lower Franconia and Aschaffenburg (762,744); Schwaben and Neuburg (859,397); total in 1925, 7,379,594. Next towns after Munich are Nürnberg, Augsburg, Würzburg, and Ratisbon (Regensburg).

**Physical.** The main portion of the country is hilly; in the south, where it belongs to the Alps, it is mountainous; but north of the Alps and south of the Danube, which flows east through the country from Ulm to Passau, there is a considerable plateau, averaging about 1600 feet above the sea-level. The south frontier is formed by a branch of the Noric Alps, offsets from which project far into the plateau; principal peaks: the Zugspitze, 10,394 feet, and the Watzmann, 9470 feet. The highest

summits on the Bohemian (Austrian) frontier, belonging to the Böhmerwald Mountains, are the Rachel, 4770 feet, and the Arber, 4790 feet. Ranges of less elevation bordering on or belonging to the country are the Fichtelgebirge in the north-east, the the Frankenwald, Rhöngebirge, and Spessart in the north, and the Steigerwald and Franconian Jura in the middle. The Palatinate is traversed by the north extremity of the Vosges Mountains, the highest peak being the Königstuhl, 2162 feet.

**Rivers.** The greater part of the country belongs to the basin of the Danube, which is navigable, its tributaries on the south being the Iller, Lech, Isar, and Inn; on the north, the Wörnitz, Altmühl, Nab, and Regen. The northern portion belongs to the basin of the Main, which receives the Regnitz and Saale, and is a tributary of the Rhine. The Palatinate has only small streams that flow into its boundary river the Rhine. The chief lakes of Bavaria are all on the higher part of the south plateau; the smaller within the range of the Alps. The Ammer-See is about 10 miles long by 2½ broad, 1736 feet above the sea; the Würm-See or Starnberger-See, about 12 miles long by 3 broad, 1899 feet; and Chiem-See, 9 miles long by 9 to 4 broad, 1651 feet. The climate in general is temperate and healthy, though somewhat colder than the other South German States; yearly average about 47° F.

**Industries.** As regards soil, Bavaria is one of the most fertile countries in Germany, producing the various cereals in abundance, the best hops in Germany, fruit, wine, tobacco, etc., and having extensive forests. Lower Franconia (the Main valley) and the Palatinate are the great vine-growing districts. The celebrated Steinwein and Leistenwein are the produce of the slopes of the Steinberg and Marienberg at Würzburg (on the Main). The forests of Bavaria, chiefly fir and pine, yield a large revenue, much timber being annually exported, together with potash, tar, turpentine, etc. The principal mineral products are salt, coal, and iron, some of the mining works belonging to the State. The minerals worked include copper, quicksilver, manganese, cobalt, porcelain clay, alabaster, graphite. Large numbers of horses and cattle are reared, as also sheep and swine. The return of cattle in 1926 showed 414,773 horses, 3,566,584 cattle, and 407,061 sheep. The manufactures are individually mostly on a small scale. The principal articles manufactured are linens, woollens, cottons, leather, paper, glass, earthen and iron ware, jewellery, etc. The optical and mathematical instruments made are excellent. A most important branch of industry is the brewing of beer, for which there are upwards of 7000 establishments, producing over 300 millions of gallons a year. The distilleries produce over 4 millions of gallons of alcohol. A number of the people maintain themselves by the manufacture of articles in wood, and by felling and hewing timber.

The trade of Bavaria in home produce exported and goods imported for consumption in the country is not large. Principal exports: corn, timber, wine, cattle, glass, hops, fruit, beer, wooden wares, etc. The chief imports are sugar, coffee, cotton, rice, spices, dye-stuffs, silk and silk goods, lead, etc. From its position Bavaria has a considerable transit trade. The König Ludwig Canal connects the Main at Bamberg with the Altmühl a short distance above its embouchure in the Danube, thus establishing water communication between the North Sea and the Black Sea. The railway system has a total mileage of 5290, mostly belonging to the State.

**Education** is in a less satisfactory condition than in most German States. There are about 7500 elementary schools, at which attendance is compulsory up to fourteen years of age. There are three universities, two of which (Munich and Würzburg) are Roman Catholic, and one (Erlangen) Protestant. In art Bavaria is best known as the home of the Nürnberg school, founded about the middle of the sixteenth century by Albert Dürer. Hans Holbein is also claimed as a Bavarian; and to these have to be added the eminent sculptors Kraft and Vischer, both born about the middle of the fifteenth century. The restoration of the reputation of Bavaria in art was chiefly the work of Ludwig I., under whom the capital became one of the most prominent seats of the fine arts in Europe. The religion of the State is Roman Catholicism, over 70 per cent of the population being Roman Catholics. All citizens, whatever their creed, possess the same civil and political rights. The dioceses of Bavaria comprise two Roman Catholic archbishoprics, Munich and Bamberg; and six bishoprics, Augsburg, Ratisbon, Eichstädt, Passau, Würzburg, and Spires.

For over a century Bavaria was a kingdom, and the crown hereditary in the male line of the descendants of the ancient Counts of Wittelsbach. The executive power was vested in the king, but his ministers were responsible for his acts. The legislature consisted of two chambers—one of

senators, composed of princes of the royal family, the great officers of the State, the two archbishops, the heads of certain noble families, and certain members appointed by the Crown; the other of deputies, 163 in number, elected by direct and secret vote, and calculated at the rate of 1 for every 38,000 inhabitants. The lower chamber was elected for six years. The army (peace footing, 72,000) was raised by conscription—every man being liable to serve from the 1st of January of the year in which he completes his twentieth year. In time of peace the army was under the command of the King of Bavaria, but in time of war under that of the Emperor of Germany, as commander-in-chief of the whole German army.

As a result of the revolutionary movement in Nov., 1918, the Bavarian dynasty was deposed and a republican form of government set up. The provisional constitution, made public on 7th Jan., 1919, established a Socialist Republic in Bavaria. The supreme power lies with the people; the Diet consists of one chamber; the suffrage is universal; the privileges of birth and caste are abolished. The supreme executive power is exercised by the ministry as a whole. The Church is separated from the State, and all religious associations have equal rights.

**History.** The Bavarians take their name from the Boii, a Celtic tribe whose territory was occupied by a confederation of Germanic tribes, called after their predecessors Boiarii. These were made tributary first to the Ostrogoths, and then to the Franks; and on the death of Charlemagne his successors governed the country by lieutenants with the title of margrave, afterwards converted (in 921) into that of duke. In 1070 Bavaria passed to the family of the Guelphs, and in 1180 by imperial grant to Otho, Count of Wittelsbach, founder of the dynasty reigning until 1918. In 1623 the reigning duke was made one of the Electors of the empire. Elector Maximilian II. joined in the War of the Spanish Succession on the side of France, and this led, after the battle of Blenheim, 1704, to the loss of his dominions for the next ten years. His son, Charles Albert, likewise lost his dominions for a time to Austria, but they were all recovered again by Charles's son, Maximilian III. (1745). In the wars following the French revolution Bavaria was in a difficult position between France and Austria, but in the end joined Napoleon, from whom its Elector Maximilian IV. received the title of king (1805), a title afterwards confirmed by the treaties of 1814 and 1815. King Maximilian I. was succeeded by his son, Ludwig (or Louis) I., under whom various circumstances helped to quicken a desire for political change. Reform being refused, tumults arose in 1848, and Ludwig resigned in favour of his son, Maximilian II., under whom certain modifications of the constitution were carried out. At his death in 1864 he was succeeded by Ludwig II. In the war of 1866 Bavaria sided with Austria, and was compelled to cede a small portion of its territory to Prussia, and to pay a war indemnity of £2,500,000. Soon after Bavaria entered into an alliance with Prussia, and in 1867 joined the Zollverein.

In the Franco-German War of 1870-71 the Bavarians took a prominent part, and it was at the request of the King of Bavaria on behalf of all the other princes and the senates of the free cities of Germany, that the King of Prussia agreed to accept the title of Emperor of Germany. From Jan., 1871, to 1918 Bavaria formed part of the German Empire, and was represented in the Bundesrath by six, and in the Reichstag by forty-eight members. The eccentricity early displayed by Ludwig II. developed to such an extent that in June, 1886, he was placed under control, and a regency established under Prince Luitpold (Leopold). The change was almost immediately followed by the suicide of the king, and as Prince Otto, the brother and heir of the late king, was insane, the regency was continued. Prince Luitpold died on 12th Dec., 1912, and his son, Ludwig, became regent. On 5th Nov., 1913, the prince was proclaimed king, under the name of Ludwig III., in succession to his cousin, King Otto, who was declared incapable of ruling. King Otto died on 12th Oct., 1916. Ludwig III. abdicated in Nov., 1918, and the Bavarian Government was taken over by a cabinet under the leadership of Kurt Eisner. Eisner was assassinated in Feb., 1919, and a struggle ensued between the moderate Socialists and the extremists of the Left. The moderate party, however, returned to power in May, 1919. In Nov., 1919, the inhabitants of the Free State of Coburg decided to join Bavaria. This was approved by the Bavarian Diet in 1920 and the Union took place.—BIBLIOGRAPHY: S. Riezler, *Geschichte Bayerns* (4 vols.); R. Piloty, *Die Verfassungsgeschichte des Königreichs Bayern*; Götz, *Geographisch-historisches Handbuch von Bayern*; M. Doeberl, *Entwickelungsgeschichte Bayerns*; C. P. Higby, *Religious Policy of the Bavarian Government during the Napoleonic Period.*

**BAXTER, Richard.** The most eminent of the English nonconforming divines of the seventeenth century, born in Rowton, Shropshire, 1615; ordained in 1638; parish minister of Kidderminster in 1640. The imposition of the oath of universal approbation of the doctrine and discipline of the Church of England (the *et cætera oath*) detached him from the Establishment. After the battle of Naseby he accepted the chaplaincy of Colonel Whalley's regiment. He can scarcely be said, however, to have separated as yet in spirit from the Establishment. He upheld the monarchy, condemned the execution of the king and the election of Cromwell, preached against the Covenant and against separatists and sectaries, but his piety won him the respect of all parties. At the Restoration he became king's chaplain, but declined the bishopric of Hereford, and on the passage of the Act of Uniformity threw in his lot entirely with the nonconformists. In 1685 he was arrested, refused a hearing by Jeffreys, and imprisoned. After his release he lived in retirement till his death in 1691. He left about 150 treatises, of which his *Saints' Everlasting Rest, Call to the Unconverted,* and *Reformed Pastor* have been the most popular.—BIBLIOGRAPHY: William Orme, *Life and Times of Richard Baxter*; J. Stalker, *Lecture on Baxter* in *The Evangelical Succession*; M'Adam Muir, *Religious Writers of England*; Currier, *Nine Great Preachers.*

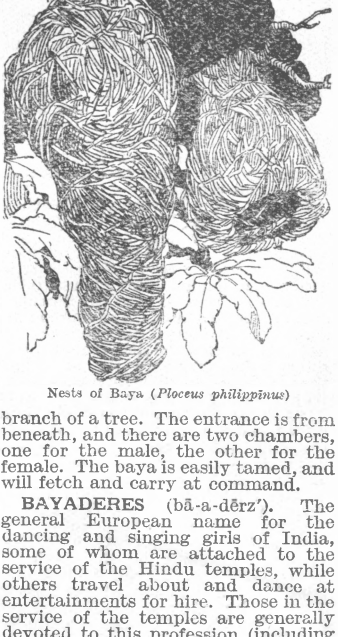
**BAXTERIANS.** Followers of Baxter in respect of his attempted compromise between Calvinism and Arminianism. They reject the doctrine of reprobation, admit a universal potential salvation, becoming actual in the case of the elect, and assert the possibility of falling from grace. The Baxterians never formed a sect or even a school, but were men of independent minds, distinguishing between essentials and non-essentials: in things necessary, unity; in things doubtful, liberty; in all things, charity. The two most eminent Baxterians were Dr. Isaac Watts and Dr. Philip Doddridge.—Cf. M'Adam Muir, *Religious Writers of England.*

**BAY.** The laurel tree, noble laurel, or sweet-bay (*Laurus nobĭlis*); but the term is loosely given to many trees and shrubs resembling this. A fatty or fixed oil (used in veterinary medicine) and also a volatile oil are obtained from the berries, but what is called "bayberry oil" is also obtained from the genus Myrica or candleberry. In N. America the fragrant-flowered *Magnolia glauca* is called sweet-bay, the red-bay being *Laurus carolinensis*, the loblolly-bay *Gordonia lasianthus*. *See* LAUREL.

**BAY.** In geography, an indentation of some size into the shore of a sea or lake, generally said to be one with a wider entrance than a gulf.

**BAY.** In architecture, a term applied to a recessed division or compartment of a building, as that marked off by buttresses or pillars.

**BA'YA.** The weaver-bird (*Plocēus philippinus*), an interesting East Indian passerine bird, somewhat like the bullfinch. Its nest resembles a bottle, and is suspended from the



Nests of Baya (*Ploceus philippinus*)

branch of a tree. The entrance is from beneath, and there are two chambers, one for the male, the other for the female. The baya is easily tamed, and will fetch and carry at command.

**BAYADERES** (bā-a-dĕrz'). The general European name for the dancing and singing girls of India, some of whom are attached to the service of the Hindu temples, while others travel about and dance at entertainments for hire. Those in the service of the temples are generally devoted to this profession (including that of prostitution) from their childhood.

**BAYAMO** (bå-yä'mō), or **ST. SALVADOR.** A town in the east of Cuba, near the Cauto. Pop. 5000.

**BAYARD** (bå-yär), **Pierre du Terrail, Seigneur de.** The *Chevalier sans*

*peur et sans reproche*, born in 1476 in Castle Bayard, near Grenoble, in Southern France. At the age of eighteen he accompanied Charles VIII. to Italy, and in the battle of Fornovo took a standard. At the beginning of the reign of Louis XII., in a battle near Milan, he entered the city at the heels of the fugitives, and was taken prisoner, but released by Ludovico Sforza without ransom. In Apulia he killed his calumniator, Sotomayor, and afterwards defended a bridge over the Garigliano singly against the Spaniards, receiving for this exploit as a coat of arms a porcupine, with the motto *Vires agminis unus habet* (" one has the strength of a band "). He distinguished himself equally against the Genoese and the Venetians, and, when Julius II. declared himself against France, went to the assistance of the Duke of Ferrara. He was severely wounded at the assault of Brescia, but returned, as soon as cured, to the camp of Gaston de Foix, before Ravenna, and after new exploits was again dangerously wounded in the retreat from Pavia.

In the war commenced by Ferdinand the Catholic he displayed the same heroism, and the fatal reverses which embittered the last years of Louis XII. only added to the personal glory of Bayard. When Francis I. ascended the throne he sent Bayard into Dauphiné, to open a passage over the Alps and through Piedmont. Prosper Colonna lay in wait for him, but was made prisoner by Bayard, who immediately after further distinguished himself in the battle of Marignano. After his defence of Mézières against the invading army of Charles V. he was saluted in Paris as the saviour of his country, receiving the honour paid to a prince of the blood. His presence reduced the revolted Genoese to obedience, but failed to prevent the expulsion of the French after the capture of Lodi.

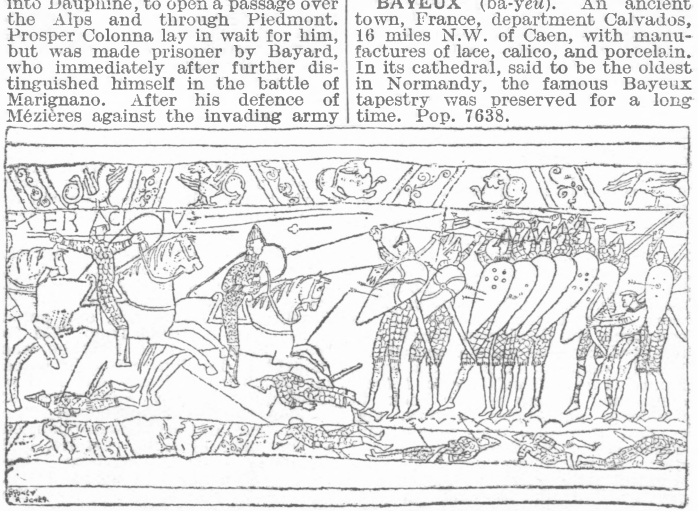
In the retreat the safety of the army was committed to Bayard, who, however, was mortally wounded by a stone from a blunderbuss in protecting the passage of the Sesia. He kissed the cross of his sword, confessed to his squire, and died, 30th April, 1524. He was buried in a church of the Minorites, at Grenoble.—BIBLIOGRAPHY: "Le Loyal Serviteur" (supposed to be Jacques de Mailles), *La très joyeuse . . . histoire . . . des faiz, gestes, triumphes et prouesses du bon chevalier sans paour et sans reproche, le gentil seigneur de Bayart* (printed in 1527); modern edition of this work by M. J. Roman; A. de Terrebasse, *Histoire de Pierre Terrail, Seigneur de Bayart*.

**BAYAZID.** *See* BAJAZET.

**BAYBERRY.** *See* BAY (tree) and CANDLEBERRY.

**BAY CITY.** An American city, Michigan, on the east side of Saginaw River, near its mouth in Saginaw Bay, Lake Huron. Chief articles of trade, lumber and salt. Pop. (1920), 47,554.

**BAYEUX** (bà-*yeu*). An ancient town, France, department Calvados, 16 miles N.W. of Caen, with manufactures of lace, calico, and porcelain. In its cathedral, said to be the oldest in Normandy, the famous Bayeux tapestry was preserved for a long time. Pop. 7638.



A section of the Bayeux Tapestry showing the Norman cavalry attacking the English footmen at the Battle of Hastings

**BAYEUX TAPESTRY.** So called because it was originally found in the cathedral of Bayeux, in the public library of which town it is still preserved. Formerly known as the "Toile de St. Jean," it is supposed to have been worked by Matilda, Queen of William the Conqueror, and to have been presented by Odo, Bishop of Bayeux, the half-brother of William, to the church in which it was found. It is 231 feet in length and 20 inches in breadth, and is divided into seventy-two compartments, the subject of each scene being indicated by a Latin inscription. These scenes give a pictorial history of the invasion and conquest of England by the Normans, beginning with Harold's visit to the Norman Court, and ending with his death at Hastings. —BIBLIOGRAPHY: Bolton Corney, *Researches and Conjectures on the Bayeux Tapestry*; Jules Comte, *Tapisserie de Bayeux*; F. R. Fowke, *The Bayeux Tapestry*.

**BAY ISLANDS.** An island group, Bay of Honduras, off N. coast of State of Honduras, incorporated as a British colony in 1852, and ceded to Honduras in 1856. The largest is Ruatan, 30 miles long. Pop. about 5000.

**BAYLE** (bāl), **Pierre.** French critic and miscellaneous writer, the son of a Calvinist preacher, born at Carlat (Languedoc) in 1647, died at Rotterdam 1706. A statue in his honour was erected at Pamiers in 1906. He studied at Toulouse, and was employed for some time as a private tutor at Geneva and Rouen. He went to Paris in 1674 and soon after was appointed professor of philosophy at Sedan. Six years after he removed to Rotterdam, where he filled a similar chair. The appearance of a comet, in 1680, which occasioned an almost universal alarm, induced him to publish, in 1682, his *Pensées Diverses sur la Comète*, a work full of learning, in which he discussed various subjects of metaphysics, morals, theology, history, and politics. It was followed by his *Critique Générale de l'Histoire du Calvinisme de Maimbourg*. This work excited the jealousy of his colleague, the theologian Jurieu, and involved Bayle in many disputes. In 1684 he undertook a periodical work, *Nouvelles de la République des Lettres*, containing notices of new books in theology, philosophy, history, and general literature. This publication, which lasted for three years, added much to his reputation as a philosophical critic. In 1693 Jurieu succeded in inducing the magistrates of Rotterdam to remove Bayle from his office.

He now devoted all his attention to the composition of his *Dictionnaire Historique et Critique*, which he first published in 1696, in 2 vols, fol. It is a vast storehouse of facts, discussions, and opinions, and though it was publicly censured by the Rotterdam consistory for its frequent impurities, its pervading scepticism, and tacit atheism, it long remained a favourite book both with literary men and with men of the world. The articles in his dictionary, in themselves, are generally of little value, and serve only as a pretext for the notes, in which the author displays, at the same time, his learning and the power of his logic. The best editions are that of 1740, in 4 vols. fol. (Amsterdam and Leyden), and that in 16 vols., published in 1820-4 at Paris.— BIBLIOGRAPHY: L. A. Feuerbach, *Pierre Bayle*; F. Brunetière, *Études Critiques* (5th series); A. Cazes, *Pierre Bayle, sa vie, ses idées, son influence, son œuvre*.

**BAY-LEAF.** The leaf of the sweet-bay or laurel tree (*Laurus nobilis*). These leaves are aromatic, and are used in cookery and confectionery. *See* BAY.

**BAYLEN** (bī-len'). *Same as* BAILEN.

**BAYLY** (bā'li), **Thomas Haynes.** English poet, novelist, dramatist, and miscellaneous writer, born 1797, died 1839. He was educated at Oxford, and intended for the Church. He wrote thirty-six pieces for the stage, most of which were successful; several novels: *The Aylmers, A Legend of Killarney*, etc.; and numerous songs. As a song-writer he was most prolific and most popular. *The Soldier's Tear, We met—'twas in a Crowd*, were the best known.

**BAY MAHOGANY.** That variety of mahogany exported from Honduras. It is softer and less finely marked than the variety known as Spanish mahogany, but is the largest and most abundant kind.

**BAYNES** (bānz), **Thomas Spencer, LL.D.** Born at Wellington, Somerset, in 1823, died suddenly in London, 1887. He studied under Sir William Hamilton at Edinburgh, and acted as his class assistant from 1851 to 1855. From 1857 to 1863 he was resident in London, where he acted as examiner in logic and mental philosophy in the University of London, and as assistant editor of the *Daily News*. In 1864 he was appointed to the chair of logic, rhetoric, and metaphysics in St. Andrews University, a post he held till his death. In 1873, when he became editor of the ninth edition of the *Encyclopædia Britannica*, his wide acquaintance

with men of letters and learning assisted him greatly in the selection of suitable contributors. He translated the *Port Royal Logic* (*see* ARNAULD), and was a frequent contributor to the principal reviews and literary journals.

**BAY'ONET** (Fr. *baïonnette*). A straight, sharp-pointed weapon, invented by a Frenchman (probably a native of Bayonne) in the seventeenth century. A bayonet was originally screwed into the muzzle of the firelock, converting it into a short pike. This system, which practically precluded any further use of the firelock as such, was later improved by a Scotsman, who fitted the weapon with a socket and bolt, enabling it to be placed over the muzzle of the musket instead of being screwed into it. The firelock could then be used for both missile and shock action, according to requirments. The bayonet replaced the pike in the English army after the revolution of 1690. The length, shape, and weight of the bayonet have varied considerably at different periods and in different countries; that at present in use in the British army is a short sword-shaped weapon, 1 foot 6 inches long and weighing about 1 pound.

**BAYONNE** (bâ-yon). A well-built fortified town, the largest in the French department Basses-Pyrénées, at the confluence of the Nive and the Adour, about 2 miles from their mouth in the Bay of Biscay; with a citadel commanding the harbour and city, a cathedral—a beautiful ancient building—shipbuilding and other industries, and a considerable trade. Among the lower class the Basque language is spoken. Catherine de' Medici had an important interview with the Duke of Alva in Bayonne, June, 1565, at which it is said the massacre of St. Bartholomew was arranged. It was also the scene of the abdication of Charles IV. of Spain in favour of Napoleon (1808). In 1814 the British forced the passage of the Nive and invested the town, from which the French made a desperate but unsuccessful sortie. Pop. 27,886.

**BAYONNE CITY.** A suburb of New York, in Hudson County, New Jersey. Pop. 76,754.

**BAYOU** (bă-yö). In the southern States of North America, a stream which flows from a lake or other stream: frequently used as synonymous with creek or tidal channel.

**BAYREUTH** (bī'roit). *See* BAIREUTH.

**BAY RUM.** A spirit obtained by distilling the leaves of *Myrica acris*, or other West Indian trees of the same genus. It is used for toilet purposes, and as a liniment in rheumatic affections.

**BAY-SALT.** A general term for coarse-grained salt, but properly applied to salt obtained by spontaneous or natural evaporation of sea-water in large shallow tanks or *bays*.

**BAYSWATER.** District of London. In the metropolitan borough of Paddington, it lies to the west of the city. It is north of Kensington Gardens and the Bayswater Road is a main thoroughfare to and from London.

**BAY-WINDOW.** A window forming a recess or bay in a room, projecting outwards, and rising from the ground or basement on a plan rectangular, semi-octagonal, or semi-hexagonal, but always straight-sided. One of the finest examples of bay-windows is that of the banqueting-hall at Hampton Court. The term is, however, also often employed to designate a *bow-window*, which more properly forms the segment of a circle, and an *oriel-window*, which is supported on a kind of bracket, and is usually on the first floor.

**BAZA** (bă'thă). An old town of Spain, Andalusia, province of Granada, formerly a large and flourishing city. In 1810 the French, under Marshal Soult, here defeated the Spaniards under Generals Blake and Freire. Pop. 15,964.

**BAZAINE** (bâ-zān), **François, Achille.** French general, born 1811, died 1888. He entered the army as a private soldier in 1831, and served in Algeria with distinction, gaining the cross of the Legion of Honour, and rising to the rank of lieutenant. He next went to Spain and fought in the Foreign Legion against the Carlists; and in 1839 returned to Algeria, where he eventually held the rank of colonel (1850). He was next engaged in the Crimean War, being at first commander of a brigade and then general of division, leading the French troops sent to attack the fortress of Kinburn (1855). He did good service also in the Italian war of 1859, being actively engaged in the battle of Solferino. His military reputation was increased by the part he took in the Mexican expedition (1862-4), in which he led the first division under Forey, and when this general was recalled became commander-in-chief of the French forces in Mexico and marshal of France. His loyalty, however, to the cause of the Emperor Maximilian was very doubtful.

In 1870 he took command of the army of the Rhine, or the third army corps, in the Franco-German War,

Bay-window at Bramhall Hall, Cheshire

collected a very large army in the neighbourhood of Metz, and had the intention of joining his forces with those of MacMahon at Châlons. He found this impossible, however, especially after Gravelotte, and was forced into Metz, where he capitulated after a seven-weeks' siege, with an army of 175,000 men. For this act he was tried by court-martial in 1871, found guilty of treason, and condemned to death. The sentence was commuted to twenty years' seclusion in the Isle of St. Marguerite, from which he escaped in 1874, and retired to Spain. He published *Épisodes de la Guerre de*

1870.—BIBLIOGRAPHY: La Brugère, *L'Affaire Bazaine*; Comte d'Herisson, *La Légende de Metz*.

**BAZAR'JIK.** Now officially called Dobritsh (q.v.).

**BAZIGARS'.** A tribe of Indians dispersed throughout the whole of Hindustan mostly in wandering tribes. They are divided into seven castes; their chief occupation is that of jugglers, acrobats, and tumblers, in which both males and females are equally skilful. They present many features analogous to the gipsies of Europe, and like these each clan has its king.

**BAZIN, René.** French novelist, born 1853. For some time he was professor of law in the Catholic University of Angers. His literary reputation was established by *Une Tache d'Encre*. His other novels include *La Terre qui meurt, De Toute son Ame, Les Oberlé, Les Noellet, Davidée Birot*, all of which have been translated into English by Dr. A. S. Rappoport. He has also written *Questions littéraires et sociales*, etc. Bazin was elected a member of the Académie Française in 1903.

**BAZZI** (bät'sē). *See* SODOMA.

**BDELLIUM** (del'i-um). An aromatic gum resin brought chiefly from Africa and India, in pieces of different sizes and figures, externally of a dark reddish brown, internally clear, and not unlike glue. To the taste it is slightly bitterish and pungent; its odour is agreeable. It is used as a perfume and a medicine, being a weak deobstruent. Indian bdellium is the produce of *Balsamodendron Roxburghii*; African of *B. africanum*; Egyptian bdellium is obtained from the doum palm; and Sicilian is produced by *Daucus gummifer*, a species of the genus to which the carrot belongs. The bdellium mentioned in Gen. ii. 12, was apparently a precious stone, perhaps a pearl. *See* MYRRH.

**BEACHES, Raised.** A term applied to those long, terraced, level pieces of land, consisting of sand and gravel, and containing marine shells, now, it may be, a considerable distance above and away from the sea, but bearing sufficient evidences of having been at one time sea-beaches. In Scotland such a terrace has been traced extensively along the coasts at about 25 feet above the present sea-level.

**BEACHY HEAD.** A promontory in the south of England, on the coast of Sussex, rising 575 feet above sea-level, with a revolving light, visible in clear weather from a distance of 28 miles. A naval battle took place here, 30th June, 1690, in which a French fleet under Tourville defeated an English and Dutch combined fleet under Lord Torrington.

**BEACONSFIELD** (bē'konz-fēld). A village of Buckinghamshire, the parish church of which contains the remains of Edmund Burke, whose seat was in the neighbourhood; while a marble monument to the poet Waller, who owned the manor, is in the churchyard. It gave the title of earl to the English statesman and novelist Benjamin Disraeli. Pop. (1931), 4843.

**BEACONSFIELD.** Formerly known as Du Toit's Pan, a town of Cape Province about a mile to the east of Kimberley, of which it forms a suburb. Pop. 20,364.

**BEACONSFIELD, Benjamin Disraeli, Earl of.** An eminent English statesman and novelist, of Jewish extraction; eldest son of Isaac D'Israeli, author of the *Curiosities of Literature*; born in London in 1804, died there in 1881, buried at Hughenden. He attended for a time a private school, and was first destined for the law, but showing a decided taste for literature he was allowed to follow his inclination. In 1826 he published *Vivian Grey*, his first novel; and subsequently travelled for some time, visiting Italy, Greece, Turkey, and Syria, and gaining experiences which were afterwards reproduced in his books. His travels and impressions are embodied in a volume of letters addressed to his sister and his father. In 1831 another novel, *The Young Duke*, came from his pen. It was followed at short intervals by *Contarini Fleming, Alroy, Henrietta Temple, Venetia, The Revolutionary Epic* (a poem), etc. In 1832, and on two subsequent occasions, he appeared as candidate for the representation of High Wycombe, with a programme which included vote by ballot and triennial parliaments, but was unsuccessful.

His political opinions gradually changed: in 1835 he unsuccessfully contested Taunton as a Tory. In 1837 he gained an entrance to the House of Commons, being elected for Maidstone. His first speech in the House was treated with ridicule; but he finished with the prophetic declaration that the time would come when they would hear him. During his first years in Parliament he was a supporter of Peel; but when Peel pledged himself to abolish the corn-laws, Disraeli became the leader of the protectionists. About this time he became a leader of what was known as the "Young England" party, the most prominent characteristic of which was a sort of sentimental advocacy of feudalism. This spirit

showed itself in his two novels of *Coningsby* and *Sybil*, published respectively in 1844 and 1845. Having acquired the manor of Hughenden, in Buckinghamshire, he was in 1847 elected for this county, and he retained his seat till raised to the peerage nearly thirty years later. His first appointment to office was in 1852, when he became Chancellor of the Exchequer under Lord Derby. The following year, however, the ministry was defeated. He remained out of office till 1858, when he again became Chancellor of the Exchequer, and brought in a Reform Bill which wrecked the Government. During the time the Palmerston Government was in office Disraeli led the opposition in the Lower House with conspicuous ability and courage.

In 1866 the Liberals resigned, and Derby and Disraeli came into power, the latter being again Chancellor of the Exchequer. They immediately brought in and carried, after a violent and bitter struggle, a Reform Bill on the basis of household suffrage. In 1868 he became Premier on the resignation of Lord Derby, but his tenure of office was short. In 1874 he again became Prime Minister with a strong Conservative majority, and he remained in power for six years. This period was marked by his elevation to the peerage in 1876 as Earl of Beaconsfield, and by the prominent part he took in regard to the Eastern question and the conclusion of the Treaty of Berlin in 1878.

In 1880 Parliament was rather suddenly dissolved, and, the new Parliament showing an overwhelming Liberal majority, he resigned office, though he still retained the leadership of his party. Within a few months of his death the publication of a novel called *Endymion* (his last, *Lothair*, had been published ten years before) showed that his intellect was still vigorous. Among others of his writings, besides those already mentioned, are: *A Vindication of the English Constitution* (1834); *Alarcos, a Tragedy* (1839); and *Lord George Bentinck, a Political Biography* (1852). —BIBLIOGRAPHY: *Selected Speeches of the Earl of Beaconsfield* (edited by T. E. Kebbel); T. Martin, *Memorials of Lord Beaconsfield*; the article *Disraeli*, by T. E. Kebbel, in *Dictionary of National Biography*; Sir William Fraser, *Disraeli and his Day*; Sichel, *Disraeli*; the best work, however, is W. F. Monypenny's *Life of Disraeli, Earl of Beaconsfield* (continued by G. E. Buckle).

**BEAD** (bēd). Originally a prayer; then a small perforated ball of gold, pearl, amber, glass, or the like, to be strung on a thread, and used in a rosary by Roman Catholics in numbering their prayers, one bead being passed at the end of each ejaculation or short prayer; finally any such small ornamental body.

**BEADLE** (bē'dl). An officer in a university, whose chief business is to walk with a mace in a public procession: also, a parish officer whose business is to punish petty offenders, and a church officer (chiefly, although not exclusively, in Scotland) with various subordinate duties, as waiting on the clergyman, keeping order in church, attending meetings of vestry or session, etc.

**BEAD-SNAKE** (*Elaps fulvus*). A beautiful snake of North America, inhabiting cultivated grounds, especially plantations of the sweet-potato, and burrowing in the ground. It is finely marked with yellow, carmine, and black. Though it possesses poison-fangs it never seems to use them.

**BEAGLE** (bē'gl). A small hound, resembling a foxhound or harrier, and used to hunt rabbits and hares, being often kept in packs. The beagle is smaller than the harrier, compactly built, smooth-haired, and with pendulous ears. The smallest of them are little larger than the lap-dog.

**BEALE, Lionel Smith.** English physician and biologist, born in 1828, died in 1906. He was educated at King's College School and King's College, London, and was a professor in the medical department of the latter institution for forty-three years, finally holding the chair of the principles and practice of medicine. His numerous published works treat of medical, anatomical, physiological, and biological subjects; the microscope; various questions of morality, etc. They include *How to Work with the Microscope*, *The Structure of the Tissues, Protoplasm, Disease Germs, Life Theories and Religious Thought, The Mystery of Life, Bioplasm, On Slight Ailments, Religio Medici, Religio Scientiæ, Religio Vitæ*, etc.

**BEAM.** A long, straight, and strong piece of wood, iron, or steel, especially when holding an important place in some structure, and serving for support or consolidation; often equivalent to *girder*. In a balance it is the part from the ends of which the scales are suspended. In a loom it is a cylindrical piece of wood on which weavers wind the warp before weaving; also, the cylinder on which the cloth is rolled as it is woven. In a ship, one of the strong transverse pieces stretching across from one side to the other to support the decks and retain the sides at their proper dis-

tance : hence a ship is said to be " on her beam ends " when lying over on her side. For calculations relating to beams, *see* Morley's STRENGTH OF MATERIALS and THEORY OF STRUCTURES.

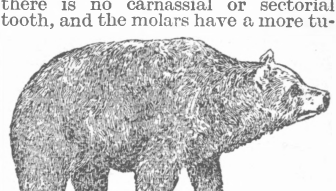
**BEAM TREE** (*Pyrus aria*). A tree of the same genus as the apple, mountain-ash, and service tree found throughout Britain, having berries that are edible when quite mellow, and yielding a hard and fine-grained wood.

**BEAN.** A name given to several kinds of leguminous seeds and the plants producing them, probably originally belonging to Asia. They belong to several genera, particularly to Vicia, garden and field bean; Phaseŏlus, French or kidney bean; and Dolichos, tropical bean. The common bean (*Vicia Faba*) is cultivated both in fields and gardens as food for man and beast. Beans were believed by some of the ancients to contain the souls of their ancestors, and Pythagoras would not eat beans for this reason. One of the bean family still retains the name of the Pythagorean bean. Beans were introduced by the Moors into Spain, whence they came to France and later to England. It is possible, however, that they were brought to Britain by the Romans. They are now largely imported from Egypt, Turkey, Greece, and the Netherlands. There are many varieties, as the Mazagan, the Windsor, the long-pod, etc., in gardens, and the horse or tick bean in fields. The soil that best suits is a good strong clay.

The seed of the Windsor is fully an inch in diameter; the horse bean is much less, often not much more than half an inch in length and three-eighths of an inch in diameter. Beans are very nutritious, containing nearly 50 per cent of digestible carbohydrate and 25 per cent of nitrogenous matter. The bean is an annual, from 2 to 4 feet high. The flowers are beautiful and fragrant. The *kidney bean, French bean,* or *haricot* is the *Phaseŏlus vulgāris,* a well-known culinary vegetable. There are two principal varieties, annual dwarfs and runners. The beans cultivated in America and largely used as articles of food belong to the genus Phaseŏlus. The *scarlet-runner bean* (*Phaseŏlus multiflorus*), a native of Mexico, is cultivated on account of its long rough pods and its scarlet flowers.

**BEAN-GOOSE** (*Anser segĕtum*). A species of wild goose, a migratory bird which arrives in Britain in autumn and retires to the north in the end of April, though some few remain to breed. Being rather less in size than the common wild goose, it is sometimes called the *small grey goose.*

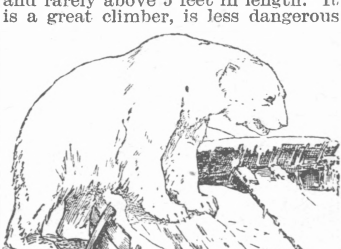
**BEAR.** The name of several large plantigrade carnivorous mammals of the genus Ursus. The teeth are forty-two in number, as in the dog, but there is no carnassial or sectorial tooth, and the molars have a more tu-



Brown or Black Bear (*Ursus arctos*)

bercular character than in other carnivores. The eyes have a nictitating membrane, the nose is prominent and mobile, and the tail very short. The true bears are about ten in number, natives chiefly of Europe, Asia, and N. America. They generally lie dormant in their den during the winter months. The brown or black bear of Europe is the *Ursus arctos.* It is a native of almost all the northern parts of Europe and Asia, and was at one time common in the British Islands. It feeds on fruits, roots, honey, ants, and, in case of need, on mammals. It sometimes reaches the length of 7 feet, the largest specimens being found farthest to the north. It lives solitarily.

The American black bear is the *U. americānus,* with black shining fur, and rarely above 5 feet in length. It is a great climber, is less dangerous



The Polar or White Bear

than the brown bear, and is hunted for its fur and flesh. It is very amusing in captivity. The grizzly bear (*U. ferox* or *horribilis*) is an inhabitant of the Rocky Mountains; it is a

ferocious animal, sometimes 9 feet in length, and has a bulky and unwieldy form, but is nevertheless capable of great rapidity of motion. The extinct cave-bear (*U. spelæus*) seems to have been closely akin to the grizzly. The Siberian bear (*U. collāris*) is perhaps a variety of the brown bear. The Polar or white bear (*U. maritimus*) is an animal possessed of great strength and fierceness. It lives in the polar regions, frequents the sea, feeds on fish, seals, etc., and usually is 7 to 8 feet in length. The Malayan or cocoa-nut palm bear (*U. malayānus*) inhabits Cochin-China, Nepaul, the Sunda Islands, etc., lives exclusively on vegetable food, and is an expert climber. It is called also sun-bear and bruang. The Indian black bear or sloth-bear of India and Ceylon (*U. labiātus*) is reputed to be a fierce and dangerous animal.

**BEAR,** or **BERE.** A species of barley (*Hordēum hexastichum*), having six rows in the ear, cultivated in Scotland and the north of England.

The Constellation of the Great Bear. The two stars on the right are the pointers

**BEAR, Great and Little.** The popular names of two constellations in the northern hemisphere. The Great Bear (*Ursa Major*) is situated near the pole. It is remarkable for its well-known seven stars, by two of which, called the Pointers, the pole-star is always readily found. These seven stars are popularly called the *Wagon*, *Charles's Wain*, or the *Plough*. The Little Bear (*Ursa Minor*) is the constellation which contains the pole-star. This constellation has seven stars placed together in a manner resembling those in the Great Bear.

**BEAR-BAITING.** The sport of baiting bears with dogs, formerly one of the established amusements, not only of the common people, but of the nobility and even royalty itself. The places where bears were publicly baited were called bear-gardens. Butler gives a description of bear-baiting in his *Hudibras*. Bear-baiting was prohibited by Act of Parliament in 1835.

**BEARBERRY** (*Arctostaphylos uva-ursi*). An evergreen shrub of the heath family growing on the barren moors of Scotland, Northern Europe, Siberia, and N. America. The leaves, under the name of *uva ursi*, are used in medicine as an astringent and tonic.

**BEARD.** The hair round the chin, on the cheeks, and the upper lip, which is a distinction of the male sex and of manhood. It differs from the hair on the head by its greater hardness and its form. Some nations have hardly any, others a great profusion. The latter generally consider it as a great ornament; the former pluck it out; as, for instance, the American Indians. The beard has often been considered as a mark of the sage and the priest. Moses forbade the Jews to shave their beards. With the ancient Germans the cutting off another's beard was a high offence. Even now the beard is regarded as a mark of great dignity among many nations in the East, as the Turks. Alexander the Great introduced shaving among the Greeks, by ordering his soldiers to wear no beards; among the Romans it was introduced in 296 B.C.

The custom of shaving came into use in modern times during the reigns of Louis XIII. and XIV. of France, both of whom ascended the throne without a beard. Till then fashion sanctioned divers forms of moustaches and beards. In the reign of Henry VIII. of England, the authorities of Lincoln's Inn prohibited wearers of beards from sitting at the great table unless they paid double commons. Taxation of beards was introduced in the reign of Elizabeth, beards of above a fortnight's growth being subject to a yearly tax of 3*s.* 4*d.* This impost was copied by Peter the Great in Russia. It is only in comparatively recent times that beards and moustaches have again become common. —Cf. Philippe, *Histoire philosophique, politique, et religieuse de la barbe.*

**BEARD-MOSS** (*Usnea barbāta*). A lichen of grey colour, forming a shaggy coat on many forest trees.

**BEARDSLEY, Aubrey Vincent.** Artist in black and white, born 1872, died 1898; took up art as a profession at the age of nineteen, and exe-

cuted a large number of drawings for books and periodicals, showing great technical skill, originality, and disregard of conventionality, with sometimes a tendency towards the repulsive or morbid. Consumption had marked him as its victim from the first. Collections of his drawings were published under the titles *A Book of Fifty Drawings, The Early Work of Aubrey Beardsley, The Late Work of Aubrey Beardsley*, etc. *Under the Hill*, with his letters and poems, was published in 1904. Cf. G. Derry, *An Aubrey Beardsley Scrap-book*.

**BEARER SECURITIES.** *See* STOCK EXCHANGE.

**BEARING.** The direction or point of the compass in which an object is seen, or the situation of one object in regard to another, with reference to the points of the compass. Thus, if from a certain situation an object is seen in the direction of north-east, the *bearing* of the object is said to be N.E. from the situation.—*To take bearings*, to ascertain on what point of the compass objects lie.

**BEAR LAKE, Great.** An extensive sheet of fresh water in the North-West Territory of Canada, between about 65° and 67° 32′ N. lat.; and under the 120th degree of W. long.; of irregular shape; area about 14,000 sq. miles. The water is very clear and the lake abounds in fish.—*Bear Lake River*, the outlet at the S.W. extremity of Great Bear Lake, runs S.W. for 70 miles and joins the Mackenzie River.

**BÉARN** (bā-ăr). One of the provinces into which France was formerly divided, now chiefly included in the department of Lower Pyrénées. Pau is the chief town (pop. 35,000).

**BEAR RIVER.** A river of the United States, 400 miles long; rises in the north of Utah, and flows northward into Idaho; turns abruptly southward, re-enters Utah, and empties into Great Salt Lake.

**BEARS AND BULLS.** *See* STOCK EXCHANGE.

**BEAR'S-GREASE.** The fat of bears, esteemed as of great efficacy in nourishing and promoting the growth of hair. The unguents sold under this name, however, are in a great measure made of hog's lard or veal fat, or a mixture of both, scented and slightly coloured.

**BEAS.** River of India. *See* BIAS.

**BEAT.** In acoustics and music, the beating or pulsation resulting from the joint vibrations of two sounds of the same strength, and all but in unison. Also a short shake or transient grace-note struck immediately before the note it is intended to ornament. The word is also used for the movement of the hand or baton, by which the rhythm of a piece of music is indicated, and by which a conductor ensures perfect agreement in tempo and accent on the part of the orchestra or chorus.

**BEATH** (bēth). A populous parish of Fifeshire, Scotland, containing the towns of Cowdenbeath, Kelty, and Hill of Beath. Pop. (1931), 21,522 (Cowdenbeath burgh having 12,731).

**BEATIFICATION.** In the Roman Catholic Church, an act by which the Pope declares a person beatified or blessed after his death. It is the first step to canonization, that is, the raising one to the honour and dignity of a saint. No person can be beatified till fifty years after his or her death. All certificates or attestations of virtues and miracles, the necessary qualifications for sainthip, are examined by the Congregation of Rites. This examination often continues for several years; after which his Holiness decrees the beatification, and the corpse and relics of the future saint are exposed to the veneration of all good Christians. The present custom dates from a Bull of Urban VIII. in 1634, although local veneration may be traced back to the earliest Christian ages.—In the Orthodox Eastern Church beatification is not distinguished from canonization.

**BEATING THE BOUNDS.** The periodical survey or perambulation by which the boundaries of parishes in England are preserved. It was the custom in some places that the clergyman of the parish, with the parochial officers and the boys of the parish school, should march to the boundaries, where the boys were struck with willow rods. A similar ceremony in Scotland was called *riding the marches*.

**BEA'TON, David.** Archbishop of St. Andrews, and cardinal, born 1494. Pope Paul III. raised him to the rank of cardinal in Dec., 1538. On the death of his uncle, Archbishop James Beaton, he succeeded him in the see of St. Andrews in 1539. After the accession of Mary he became Chancellor of Scotland, and distinguished himself by his zeal in persecuting members of the Reformed party, among the rest the famous Protestant preacher George Wishart, whose sufferings at the stake he viewed from his window with apparent exultation. At length a conspiracy was formed against him, and he was assassinated at his own castle of St. Andrews, on the 29th May, 1546. His private character was marked by pride, cruelty, and licentiousness.

**BEATRICE PORTINARI** (bā-à-trē-chā por-tē-nā'rē). The "glorious lady" of Dante, born about 1266, died 1290; the daughter of a wealthy citizen of Florence, and wife of Simone de Bardi. She was but eight years of age, and Dante nine, when he met her first at the house of her father. He altogether saw her only once or twice, and she probably knew little of him. The story of his love is recounted in the *Vita Nuova*, which was mostly written after her death.

**BEATTIE** (bē'ti), **James.** A Scottish poet and philosophical writer, born at Laurencekirk, Kincardineshire, in 1735, died at Aberdeen 1803. He studied at Marischal College, Aberdeen, for four years, and received the M.A. degree. In 1753 he was appointed schoolmaster at Fordoun, a few miles from his native place; from whence he obtained a mastership in the Grammar School of Aberdeen, and ultimately was installed professor of moral philosophy and logic in Marischal College.

In 1765 he published a poem, *The Judgment of Paris*, and in 1770 his celebrated *Essay on the Nature and Immutability of Truth*, attacking Helvetius and Hume and advocating what was afterwards called the doctrine of Common Sense, for which the University of Oxford conferred on him the degree of D.C.L., and George III. honoured him, when on a visit to London, with a private conference and a pension. He next published in 1771 the first book of his poem *The Minstrel*, and in 1774 the second; this is the only work by which he is now remembered. In 1776 he published dissertations on *Poetry and Music, Laughter and Ludicrous Composition*, etc.; in 1783 *Dissertations, Moral and Critical*; in 1786 *Evidences of the Christian Religion*; and in 1790-3 *Elements of Moral Science*. His closing years were darkened by the death of his two sons.—BIBLIOGRAPHY: Margaret Forbes, *Beattie and His Friends*; A. Mackie, *James Beattie, the Minstrel: Some Unpublished Letters*.

**BEATTIE, William, M.D.** Scottish physician, poet, and miscellaneous writer, born in 1793, died at London 1875. He was author of the standard *Life of Thomas Campbell*, whose intimate friend he was; published several poems, including *John Huss, The Heliotrope*, and *Polynesia*; wrote a series of descriptive and historical works, beautifully illustrated by his friend and fellow-traveller, W. H. Bartlett, on Switzerland, Scotland, etc. He had a very extensive and lucrative medical practice.

**BEATTY, Admiral of the Fleet, Earl.** Born in 1871. He entered the navy in 1884, became Commander in 1898, Rear-Admiral in 1910, and Vice-Admiral in 1915. He served in the Sudan from 1896 to 1897, and in China in 1900. In 1912 he was Naval Secretary to the First Lord of the Admiralty, and from 1912 to 1916 commanded the First Battle Cruiser Squadron. He distinguished himself in the battle of Jutland in 1916, and until 1919, when he succeeded Admiral Sir Rosslyn Wemyss (now Lord Wester Wemyss) as First Sea Lord, he was in command of the Grand Fleet.

When the entire German High Seas Fleet left port on 31st May, 1916, and steamed up the west coast of Denmark, it was quickly sighted by the British scouts, so that the main British fleet immediately steamed out from its base to engage the enemy. The British Battle Cruiser Squadron under the command of Earl Beatty (then Sir David) was nearer the scene than the main battle fleet under Sir John Jellicoe (Viscount Jellicoe of Scapa since 1918). The admiral sighted the enemy fleet north-west of the Horn Reef, and about 3.30 in the afternoon the ships engaged. The Jutland battle lasted only a few hours. At the end of Nov., 1916, Admiral Sir John Jellicoe was made First Sea Lord of the Admiralty, and Vice-Admiral Sir David Beatty took over the supreme command of the Grand Fleet.

He is a D.S.O., an O.M., a G.C.B., a G.C.V.O., and a Grand Officer of the French Legion of Honour. He was knighted in 1914, and received a grant of £100,000 in Aug., 1919, when he was created an earl. He was elected Lord Rector of Edinburgh University in 1917. From 1919 till 1927, when he was appointed a member of the Privy Council, he was First Sea Lord.

**BEAUCAIRE** (bō-kār). A small commercial city of Southern France, department Gard, on the Rhone opposite Tarascon, with which it communicates by a fine suspension-bridge. It is chiefly famous for its great fair (founded in 1217), held yearly from the 21st to the 28th July. Pop. 8488.

**BEAUCHAMP** (bō-shān), **Alphonse de.** French historian and publicist, born at Monaco 1767, died at Paris 1832. Under the Directory he had the surveillance of the press, a position which supplied him with materials for his *History of La Vendée*. He contributed to the *Moniteur* and the *Gazette de France*. Among his chief works are the *History of the Conquest of Peru*, the *History of Brazil*, and the *Life of Louis XVIII*. The *Mémoires*

*de Fouché* is also with good reason ascribed to him.

**BEAUFORT** (bō'fort), **Henry, Cardinal.** Natural son of John of Gaunt and half-brother of Henry IV., King of England, born 1377, died 1447; was made Bishop of Lincoln, whence he was translated to Winchester. He repeatedly filled the office of Lord Chancellor, and took part in all the most important political movements.

**BEAUFORT SCALE.** *See* METEOROLOGY; STORM SIGNALS.

**BEAUFORT WEST.** A town of Cape Province, capital of the division of that name, 339 miles by railway north-east of Cape Town, well built and well supplied with water, though in a district with a small rainfall, and chiefly yielding wool. It is a popular health resort. Pop. 4530.

**BEAUGENCY** (bō-zhàn-sē). An ancient town, France, department Loiret, on the Loire, of some historical interest. General Chanzy was defeated there by the Grand-Duke of Mecklenburg, 7th-8th Dec., 1870. Pop. 3532.

**BEAUHARNAIS** (bō-ár-nā), **Alexandre, Viscount.** Was born in 1760 in Martinique. He married Joséphine Tascher de la Pagerie, who was afterwards the wife of Napoleon. At the breaking out of the French Revolution he was chosen a member of the National Assembly, of which he was for some time president. In 1792 he was general of the army of the Rhine. He was falsely accused of having promoted the surrender of Mainz, and was sentenced to death in 1794.

**BEAUHARNAIS, Eugène de.** Duke of Leuchtenberg, Prince of Eichstädt, and Viceroy of Italy during the reign of Napoleon, was born 1781, died at Munich 1824. He was the son of Alexandre Beauharnais and Joséphine, afterwards wife of Napoleon and Empress of France. After his father's death he joined Hoche in La Vendée, and subsequently studied for a time in Paris. He accompanied Napoleon to Egypt in 1798, rose rapidly in the army, was appointed Viceroy of Italy in 1805, and married a daughter of the King of Bavaria in 1806. He administered the government of Italy with great prudence and moderation, and was much beloved by his subjects. In the Russian campaign he commanded the third *corps d'armée*, and greatly distinguished himself. To him and to Ney France was mainly indebted for the preservation of the remains of her army during the retreat from Moscow.

After the battle of Lützen of 2nd May, 1813, where, by surrounding the right wing of the enemy, he decided the fate of the day, he went to Italy, which he defended against the Austrians until the deposition of Napoleon. After the fall of Napoleon he concluded an armistice, by which he delivered Lombardy and all Upper Italy to the Austrians. He then went immediately to Paris, and thence to his father-in-law at Munich, where he afterwards resided.—His sister, Hortense Eugénie, Queen of Holland, was born in 1783, died in 1837. She became Queen of Holland by marrying Louis Bonaparte, and after Louis's abdication of the throne she lived apart from him. She wrote several excellent songs, and composed some deservedly popular airs, among others the well-known *Partant pour la Syrie*. Napoleon III. was her third and youngest son.

**BEAULY** (bū'li). A small seaport of Scotland, Inverness-shire, near the mouth of the River Beauly, which enters the Beauly Firth, a sea loch branching off from Inverness Firth, with interesting ruins of an old priory. Pop. 800.

**BEAUMARCHAIS** (bō-mär-shā), **Pierre Augustin Caron de.** A French wit and dramatist, was born at Paris in 1732, died 1799. He was the son of a watchmaker named Caron, whose trade he practised for a time. He early gave striking proofs of his mechanical and also of his musical talents; attained proficiency as a player on the guitar and harp, and was appointed harp-master to the daughters of Louis XV. By a rich marriage (after which he added "de Beaumarchais" to his name) he laid the foundation of the immense wealth which he afterwards accumulated by his speculations, and which was also increased by a second marriage.

In the meantime he occupied himself with literature, and published two dramas—*Eugénie* in 1767 and *Les Deux Amis* in 1770. He first really distinguished himself by his *Mémoires* (Paris, 1774), or statements in connection with a lawsuit, which by their wit, satire, and liveliness entertained all France. The *Barber of Seville* (1775) and the *Marriage of Figaro* (1784) have given him a permanent reputation. His last work was *Mes Six Époques*, in which he relates the dangers to which he was exposed in the revolution. He lost about a million livres by his edition of the works of Voltaire (1785), and still more at the end of 1792 by his attempt to provide the French army with 60,000 muskets. He was a singular instance of versatility of talent, being at once an artist, politician, projector, merchant, and dramatist. —BIBLIOGRAPHY: L. de Loménie,

*Beaumarchais et son temps* (English translation by H. S. Edwards); Gudin de la Brenellerie, *Histoire de Beaumarchais*.

**BEAUMARIS** (bō-ma'ris). A seaport and municipal borough, North Wales, Isle of Anglesey, on the Menai Strait. It is a watering-place, and contains the remains of a castle built by Edward I. Pop. (1931), 1708.

**BEAUMONT.** A city of the United States, in Eastern Texas, in a region rich in cotton, timber, and petroleum, and an important railway centre. Pop. 40,422.

**BEAUMONT** (bō'mont), **Francis,** and **FLETCHER, John.** Two eminent English dramatic writers, contemporaries of Shakespeare, and the most famous of literary partners. The former, son of a common-pleas judge, was born at Grace-Dieu, in Leicestershire, in 1584, died in 1616, and was buried in Westminster Abbey. At the age of sixteen he published a translation, in verse, of Ovid's *Fable of Salmacis and Hermaphroditus*, and before nineteen became the friend of Ben Jonson. With Fletcher also he was early on terms of friendship. He married Ursula, daughter of Henry Isley of Sunridge, in Kent, by whom he left two daughters.—*John Fletcher* was born at Rye, Sussex, in 1579. His father was successively Dean of Peterborough, Bishop of Bristol, Worcester, and London. *The Woman Hater*, produced in 1606-7, is the earliest work known to exist in which he had a hand. He died in London of the plague, Aug., 1625, and was buried at St. Saviour's, Southwark.

The friendship of Beaumont and Fletcher, like their literary partnership, was singularly close; they lived in the same house, and are said to have even had their clothes in common. The works that pass under their names consist of over fifty plays, a masque, and some minor poems. It is believed that all the minor poems except one were written by Beaumont. After the death of Beaumont, Fletcher continued to write plays alone or with other dramatists. It is now difficult, if not indeed impossible, to determine with certainty the respective shares of the two poets in the plays passing under their names. According to the testimony of some of their contemporaries, Beaumont possessed the deeper and more thoughtful genius, Fletcher the gayer and more idyllic. *Four Plays in One, Wit at Several Weapons, Thierry and Theodoret, Maid's Tragedy, Philaster, King and no King, Knight of the Burning Pestle, Cupid's Revenge, Little French Lawyer, Scornful Lady, Coxcomb*, and *Laws of Candy* have been assigned to Beaumont and Fletcher conjointly. To Beaumont alone—*The Masque of the Inner Temple and Gray's Inn*. To Fletcher alone — *The Faithful Shepherdess, Woman Hater, Loyal Subject, Mad Lover, Valentinian, Double Marriage, Humorous Lieutenant, Island Princess, Pilgrim, Wild-goose Chase, Spanish Curate, Beggar's Bush, Rule a Wife and Have a Wife, Fair Maid of the Inn*, etc. To Fletcher and Rowley—*Queen of Corinth, Maid of the Mill*, and *Bloody Brother*. To Fletcher and Massinger—*False One* and *Very Woman*. To Fletcher and Shirley—*Noble Gentleman, Night-walker*, and *Love's Pilgrimage*. To Fletcher and Shakespeare—*Two Noble Kinsmen*.—BIBLIOGRAPHY: G. C. Macaulay, *Francis Beaumont, a Critical Study*; Sir A. W. Ward, *History of English Dramatic Literature* (vol. ii.).

**BEAUMONT, Sir George.** Born of an ancient family in Leicestershire in 1753, died 1827. He possessed considerable skill as a landscape-painter, but was noted more especially as a munificent patron of the arts. The establishment of the National Gallery was mainly owing to his exertions. He was a friend of Wordsworth, who dedicated to him the 1815 edition of his Poems.

**BEAUMONT, Sir John.** Born 1582, died 1627, brother of Francis Beaumont the dramatist; was author of *Bosworth Field*, an historical poem, and various sacred and other poems. A poem in eight books, called *The Crown of Thorns*, has been lost.

**BEAUMONT, Joseph, D.D.** Born 1615, died 1699; descended from an old Leicestershire family. In 1663 he became master of Peterhouse, Cambridge. He wrote *Psyche, or Love's Mystery*, a poem once very popular, and an attack on Henry More's *Mystery of Godliness*, for which he received the thanks of the university.

**BEAUMONT, William, M.D.** An American surgeon, born 1785, died 1853. His experiments on digestion with the Canadian St. Martin, who lived for years after receiving a gunshot wound in the stomach which left an aperture of about two inches in diameter, were of great importance to physiological science.

**BEAUMONT-HAMEL.** Village of France, department Somme, the scene of fierce fighting in 1918. *See* EUROPEAN WAR.

**BEAUNE** (bōn). A town, France, department Côte d'Or, 23 miles

S.S.W. of Dijon, well built, with handsome church, public library, museum, etc., and a trade in the fine Burgundy and other wines of the district. Pop. 13,409.

**BEAUNE** (bōn) **Florimond.** A distinguished mathematician and friend of Descartes, born at Blois, 1601, died at the same place, 1652. He may be regarded as the originator of the integral calculus.

**BEAUREGARD** (bō'rė-gård), **Pierre Gustavus Toutant.** A general of the Confederate troops in the American Civil War, born in 1818 near New Orleans. He studied at the military academy, West Point, and left it as artillery lieutenant in 1838. He served in the Mexican War, and on the outbreak of the Civil War joined the Confederates. He commanded at the bombardment of Fort Sumter, gained the battle of Bull Run, lost that of Shiloh, assisted in the defence of Charleston, and aided Lee in that of Richmond. He was the author of *Principles and Maxims of the Art of War* (1863). He died in 1893.

**BEAUSOBRE** (bō-sō-br), **Isaac.** Born in 1659 at Niort, in France, died at Berlin, 1738. In 1683 he became Protestant minister of Chatillon-sur-Indre, but was compelled by persecution to go into exile in 1685. In 1694 he became minister to French Protestants at Berlin. He enjoyed much of the favour both of Frederick William I. and of the Crown Prince, afterwards Frederick the Great, and died in 1738. His most remarkable work is the *Histoire Critique de Manichée et du Manichéisme* (1734).

**BEAUVAIS** (bō-vā; ancient, **BELLOVACUM**). A town, France, capital of the department of Oise, at the confluence of the Avelon with the Thérain, 43 miles north of Paris, poorly built, but with some fine edifices, the choir of the uncompleted cathedral being one of the finest specimens of Gothic architecture in France. In 1472 Beauvais resisted an army of 80,000 Burgundians under Charles the Bold. On this occasion the women particularly distinguished themselves, and one of them, Jeanne Lainé, called La Hachette, seeing a soldier planting a standard on the wall, seized it and hurled him to the ground. The banner is preserved in the town hall, and an annual procession of young girls commemorates the deed. Manufactures: tapestry and carpets, trimmings, woollen cloth, cottons, etc. Pop. 20,250.

**BEAVER.** The largest rodent quadruped now existing in the northern hemisphere, about 2 feet in length exclusive of the tail, genus Castor (*C. fiber*), is now found in considerable numbers only in North America, living in colonies, but occurring solitary in Central Europe and Asia. It has short ears, a blunt nose, small fore-feet, large webbed hind-feet, with a flat ovate tail covered with scales on its upper surface. It is valued for its fur, which used to be largely employed in the manufacture of hats, but for which silk is now for the most part substituted, and for an odoriferous secretion named castor, at one time in high repute, and still largely used in some parts of the world as an antispasmodic medicine. The food of the beaver consists of the bark of trees, leaves, roots, and berries. Their favourite haunts are rivers and lakes which are bordered by forests. In winter they live in houses, which are 3 to 4 feet high, are built on the water's edge, and, being substantial structures with the entrance under water, afford them protection from wolves and other wild animals. These dwellings are called beaver "lodges," and accommodate a single family. They also live in burrows. They can gnaw through large trees with their strong teeth, this being done partly to obtain food, partly

Beavers (*Castor fiber*)

to get materials for houses or dam-building. When they find a stream not sufficiently deep for their purpose, they throw across it a dam constructed with great ingenuity of wood, stones, and mud. Beavers were fairly numerous in Britain in very early times, at least in Scotland and Wales. Their existence has been recorded in Wales till the thirteenth century, and in Scotland to a later date, but they are now extinct in Britain. A colony was some years ago introduced into the Island of

Bute, but they died out again.—BIBLIOGRAPHY: Harting, *British Animals Extinct within Historic Times*; E. A. Mills, *In Beaver World*; A. A. R. Dugmore, *The Romance of the Beaver*.

**BEAVER** (from Fr. *bavière*, a child's bib, from *bave*, saliva). The movable face-guard of a helmet, so fitted on as to be raised and lowered at pleasure.

**BEAVER FALLS.** A town of the United States, Pennsylvania, on Beaver River, 30 miles north-west of Pittsburg, in the coal and natural-gas region. Pop. 12,191.

**BEAVER-RAT** (*Hydromys chrysogaster*). A Tasmanian rodent quadruped, inhabiting the banks both of salt and fresh waters. They are admirable swimmers and divers, and exceedingly shy.

**BEBEE'RU** *See* GREENHEART.

**BEBEL** (bā'bl), **Ferdinand August.** German Socialist, born in 1840, died in 1913. He became a master turner in Leipzig, was elected to the Reichstag or Diet of the new German Empire in 1871, in which he was prominent until his death. He opposed the leadership of Prussia in Germany and the establishment of the empire, and showed himself favourable to the Paris Commune and the International. Found guilty of treasonable practices, he was condemned to two years' imprisonment in a fortress in 1872, with six months' ordinary imprisonment for insulting the Kaiser. His influence kept on increasing as leader of the Social Democrats in Germany and in the German Parliament, where he spoke strongly against militarism and the emperor's naval policy. His works include *Die Frau und der Socialismus* (Woman and Socialism), in which he went so far as to attack marriage as an institution; *Die Socialdemokratie und das allgemeine wahlrecht*; *Für Volkswehr gegen Militarismus*; *Aus meinem Leben*; etc.

**BEC.** A celebrated abbey of France, in Normandy, near Brionne, founded in the eleventh century, now represented only by some ruins. Lanfranc and Anselm were both connected with this abbey.

**BECCAFI'CO.** A European bird (*Sylvia hortensis*), the garden-warbler. These birds are much esteemed as dainties in the autumn, when they have fattened on figs and grapes.

**BECCAFU'MI, Domen'ico.** Italian painter, born near Sienna in the latter half of the fifteenth century, enriched the churches of Sienna with many noble frescoes and other paintings. He drew and coloured well, and possessed strong inventive powers. He died at Sienna in 1551, and was buried in its cathedral.

**BECCARIA** (bek-à-rē'à), **Cesare Bonesana, Marchese di.** Italian economist and writer on penal laws, born 1738, died 1794. He is principally known from his treatise, *On Crimes and Punishments*, which was speedily translated into various languages, and to which many of the reforms in the penal codes of the principal European nations are traceable. He became professor of political economy at Milan, where he died.

**BECCARIA** (bek-à-rē'à), **Giovanni Battista.** An Italian natural philosopher, born 1716, died 1781; was appointed professor of experimental physics at Turin, 1748; author of a treatise on *Natural and Artificial Electricity, Letters on Electricity*, etc. He contributed several articles to the *Transactions of the Royal Society of London*, and was commissioned in 1759 to measure an arc of the meridian in the neighbourhood of Turin.

**BECCLES** (bek'lz). A municipal borough in Suffolk, England, 33 miles N.N.E. from Ipswich, on the right bank of the Waveney; has a fine church of the fourteenth century, and a good trade coastwise. Pop. (1931), 6544.

**BECELÆRE.** Town of Belgium, province of West Flanders. It was the scene of fighting in the third battle of Ypres (1917), and in the battle of Flanders (1918).

**BECERRA** (be-ther'à), **Gaspar.** Spanish painter and sculptor, born 1520, died 1570. He studied under Michelangelo at Rome, and is credited with the chief share in the establishment of the fine arts in Spain.

**BECHE** (bāsh), **Sir Henry de la.** An English geologist, born 1796, died 1855. He founded the geological survey of Great Britain, which was soon undertaken by the Government, de la Beche being appointed director-general. He also founded the Jermyn Street Museum of Economic or Practical Geology, and the School of Mines. His principal works are: *Geology of Jamaica, Classification of European Rocks, Geological Manual, Researches in Theoretical Geology, Geology of Cornwall, Devon, and West Somerset*, etc.

**BÊCHE-DE-MER** (bāsh-dė-mār). *See* TREPANG.

**BECHSTEIN** (beh'stīn), **Johann Matthäus.** German naturalist, born in 1757, died in 1822. He wrote a popular *Natural History of Germany*,

and various works on forestry, in which subject his labours were highly valuable. In Britain he is best known by a treatise on cage birds.

**BECHUANAS,** or **BETCHUANAS** (bech-wan'az). A widely-spread race of people inhabiting the central region of South Africa north of Cape Province. They belong to the great Kaffir stem, and are divided into tribal sections. They live chiefly by husbandry and cattle-rearing, and they work with some skill in iron, copper, ivory, and skins. They were led to seek British protection owing to the encroachments of the Boers. The southern portion of their territory was first placed under British protection in 1885, and subsequently the whole Bechuana country up to the Zambezi was annexed. In 1895 the southern portion (then a Crown colony) was united to the Cape Colony; the remainder is still a protectorate partly under native chiefs. The headquarters of the British administration are at Mafeking in the Cape Province. Bechuanaland Protectorate comprises the territory lying between the Molopo River on the south and the Zambesi on the north, and extending from the Transvaal Province and Matabeleland on the east to South-West Africa; area, 275,000 sq. miles; pop. 153,000, of whom about 1700 are Europeans. It is generally flat or slightly undulating, and is essentially a grass country, the grasses being nutritious and standing drought well. Surface water is scarce, but there is underground water, besides swampy lakes such as Ngami. Gold, coal, and copper have been found. Caprivi Zipfel (*see* SOUTH-WEST AFRICA) is now administered as part of Bechuanaland.—Cf. G. W. Stow, *The Native Races of South Africa.*

**BECKENHAM.** A suburban locality on the south of London, in West Kent, now forming an urban district. Pop. (1931), 43,834.

**BECK'ER, Wilhelm Adolf.** German archæologist, born at Dresden, 1796, died at Meissen, 1846. In 1828 he became a teacher at Meissen, in 1837 was appointed extraordinary professor of classical archæology at Leipzig, and in 1842 ordinary professor. Best-known works: *Gallus, or Roman Scenes of the Time of Augustus*; and *Charicles, or Illustrations of the Life of the Ancient Greeks,* which wonderfully reproduce the social life of old Rome and Greece.

**BECK'ET, Thomas** (the form **A Becket** is also common). Archbishop of Canterbury, born in London 1117 or 1119, assassinated in Canterbury Cathedral, 29th Dec., 1170. He was educated at Oxford and Paris, and was sent, by the favour of Theobald, Archbishop of Canterbury, to study civil law at Bologna in Italy, and on his return made Archdeacon of Canterbury and Provost of Beverley. In 1158 Henry II. appointed him High Chancellor and preceptor to his son, Prince Henry—the first instance after the Conquest of a high office being filled by a native Englishman. At this period he was a complete courtier, conforming in every respect to the humour of the king. He was, in fact, the king's prime companion, held splendid levees, and courted popular applause. On the death of Theobald, 1162, he was consecrated archbishop, when he affected an extraordinary austerity of character, and appeared as a zealous champion of the Church against the aggressions of the king, whose policy was to have the clergy in subordination to the civil power.

Becket was forced to assent to the Constitutions of Clarendon, but a series of bitter conflicts with the king followed, ending in Becket's flight to France, when he appealed to the Pope, by whom he was supported. After much negotiation a sort of reconciliation took place in 1170, and Becket returned to England, resumed his office, and renewed his defiance of the royal authority. A rash hint from the king induced four barons, Reginald Fitz-Urse, William de Tracey, Hugh de Morville, and Richard Breto, to go to Canterbury and murder the archbishop while at vespers in the cathedral. He was canonized in 1172 by Pope Alexander III., and the splendid shrine erected at Canterbury for his remains was, for three centuries, a favourite place of pilgrimage. —BIBLIOGRAPHY: J. C. Robertson and J. B. Sheppard, *Materials for the History of Archbishop Becket* (Rolls Series); Canon Morris, *Life and Martyrdom of St. Thomas Becket*; Lhuillier, *Saint Thomas de Cantorbéry*; Abbott, *St. Thomas of Canterbury, His Death and His Miracles.*

**BECKETT, Gilbert Abbot A.** *See* A BECKETT.

**BECK'FORD, William.** An English writer famous in his time for his immense wealth and his eccentricities. He was born at Fonthill, his father's estate in Wiltshire, in 1759. In 1770 the death of his father left him in the possession of £1,000,000 of money, and an income of £100,000 a year. He travelled much, and for some time lived in Portugal. He

expended an enormous sum in building and rebuilding Fonthill Abbey, near Salisbury, which he filled with rare and expensive works of art. Here he lived in seclusion for twenty years. In 1882 the abbey and greater part of its contents were sold, and he retired to Bath, where, with a much-diminished fortune, but one amply sufficient, he lived till 1844. His literary fame rests upon his Eastern tale *The History of the Caliph Vathek*, which he wrote in French, and a translation of which by the Rev. Samuel Henley appeared at London in 1786. The tale is still much read, and was highly commended by Lord Byron. He had two daughters, one of whom became Duchess of Hamilton, and brought his valuable library to this family.—*William Beckford*, his father, a London merchant and West Indian proprietor, was famous for a spirited speech made to George III. when Lord Mayor of London.—BIBLIOGRAPHY: Cyrus Redding, *Memoir*; R. Garnett, *Vathek* (with a critical essay); Melville, *The Life and Letters of William Beckford of Fonthill*.

**BECKMANN, Johann.** German writer on the industrial arts and agriculture, born 1739, died 1811. He was for a short time professor of physics and natural history at Leningrad, and afterwards for almost forty-five years professor of philosophy and economy in Göttingen. His *History of Inventions* is well known in the English translation of it. This work entitled the author to be regarded as the founder of scientific technology.

**BECQUEREL** (bek-rel), **Antoine César.** French physicist, born 1788, died 1878. He served as an officer of engineers, and retired in 1815, after which he devoted himself to the study of electricity, especially electro-chemistry. In 1837 he was awarded the Copley medal of the Royal Society of London. He refuted the "theory of contact" by which Volta explained the action of his pile or battery. Becquerel may be considered one of the creators of electro-chemistry.—His son, Alexandre Edmond (1820-91), was associated with him in much of his work. He was the author of a work *La Lumière, ses causes et ses effets* (1867-8).

**BECQUEREL RAYS** (bek-rel). The rays given out by radium and other "radioactive" substances, so named from their discoverer, the French physicist, Henri Becquerel (born 1852, died 1908), son of Alexandre Edmond Becquerel. They were first detected in 1896, as proceeding from uranium salts; and it is only by uranium, thorium, radium, and one or two other elements that they are emitted, these bodies giving them out spontaneously and without any apparent loss of radioactive power or change of any kind. The Becquerel rays are invisible, and only known by their effects, which are of various kinds; thus, like the Röntgen rays, they blacken a photographic plate, even after passing through glass or other intervening substances; they cause a number of different substances to give out a fluorescent light, and they render air a conductor of electricity. Like the Röntgen rays, they act strongly on the human skin. They consist of a mixture of $\alpha$-, $\beta$-, and $\gamma$-rays. *See* RADIO-ACTIVITY; RADIUM.

**BECSE** (bech'e), **OLD.** A town of Yugoslavia, 48 miles S. of Szeged, on the right bank of the Theiss. Pop. 19,000.—**New Becse,** a market town on the left bank of the Theiss, 5 miles E. of Old Becse. Pop. 7725, or, with the immediately adjoining village of Franyova, about 15,000. Both towns carry on an extensive trade in grain.

**BECSKEREK** (bech'ke-rek). Two towns of South Hungary.—*Great Becskerek*, now in Yugoslavia, is on the Bega, 45 miles N. of Belgrade, with which it communicates by the Bega Canal. Trade in cattle and agricultural produce. Pop. 26,407.—*Little Becskerek*, now belonging to Romania, is 11 miles by railway from Temesvar. Pop. 3660.

**BED, BEDSTEAD.** An article of furniture to sleep or rest on. The term *bed* property is applied to a large flat bag filled with feathers, down, wool, or other soft material, and also to a mattress supported on spiral springs or form of elastic chains or wirework which is raised from the ground on a bedstead. The term, however, sometimes includes the bedstead or frame for supporting the bed. The forms of beds are necessarily very various—every period and country having its own form of bed. Air-beds and water-beds are much used by invalids.

**BED.** In geology, a layer or stratum, usually a stratum of considerable thickness.

**BEDA.** *See* BEDE.

**BÉDARIEUX** (bā-dăr-i-*eu*). A thriving town, Southern France, department Hérault, situated on the Orb. Pop. 6186.

**BED-BUG.** *See* BUG.

**BED-CHAMBER, Lords of the.** Officers of the royal household of Britain under the Groom of the Stole. They are twelve in number, and wait a week each in turn. In the case of a queen regnant these posts are occupied by ladies, called *Ladies of the Bed-Chamber.*

**BEDDOES** (bed'ōz), **Thomas.** Physician and author, born 1760; educated at Oxford, London, and Edinburgh. After taking his doctor's degree, and visiting Paris, he was appointed professor of chemistry at Oxford. There he published some excellent chemical treatises, and essays upon such subjects as the calculus, sea-scurvy, consumption, catarrh, and fever. His expressed sympathy with the French revolutionists led to his retirement from his professorship in 1792, soon after which he published his *Observations on the Nature of Demonstrative Evidence,* and the exceedingly popular *History of Izaac Jenkins.* In 1794 he married a sister of Maria Edgeworth; and in 1798, with the pecuniary aid of Wedgwood, opened a pneumatic institution for curing phthisical and other diseases by inhalation of gases. It speedily became an ordinary hospital, but was noteworthy as connected with the discovery of the properties of nitrous oxide, and as having been superintended by the young Humphry Davy. Beddoes' essays *On Consumption* (1779) and *On Fever* (1807), and his *Hygeia* (3 vols., 1807) had a high contemporary repute. He died in 1808.

**BEDDOES, Thomas Lovell.** Poet, son of above, born 1803, died 1849; published *The Bride's Tragedy* while a student at Oxford, studied medicine, and lived long abroad. His work was largely fragmentary, but his posthumous *Death's Jest-book, or The Fool's Tragedy* (1850), received the high praise of such judges as Landor and Browning. His *Poems,* with memoir, appeared in 1851.

**BEDE, BEDA,** or **BÆDA.** Known as the Venerable, English historian and theologian, born in 672 or 673 in the neighbourhood of Monkwearmouth, County Durham; educated at St. Peter's Monastery, Wearmouth; took deacon's orders in his nineteenth year at St. Paul's Monastery, Jarrow, and was ordained priest at thirty by John of Beverley, Bishop of Hexham. His life was spent in studious seclusion, the chief events in it being the production of homilies, hymns, lives of saints, commentaries, and works in history, chronology, grammar, etc. He was the most learned Englishman of his day, and in some sense the father of English history, his most important work being his *Historia Ecclesiastica Gentis Anglorum* (or *Ecclesiastical History of England*), afterwards translated by King Alfred into Anglo-Saxon. Besides his familiarity with Latin, he knew Greek and had some acquaintance with Hebrew. Most of his writings were on scriptural and ecclesiastical subjects, but he also wrote on chronology, physical science, grammar, etc., and had considerable ability in the writing of Latin verse.

He died in 735, an interesting record of his closing days being preserved in a letter by his pupil Cuthbert. His body was after a lapse of time removed from Jarrow church to Durham, but of the shrine which formerly enclosed them only the Latin inscription remains, ending with the verse—"Hac sunt in fossa Bedæ venerabilis ossa." On 13th Nov., 1899, Leo XIII. decreed that the feast of the Venerable Bede should be celebrated in the Church on 27th May. An edition of the whole works of Bede (12 vols.), with an English translation, was prepared by Dr. Giles (1843-4).—BIBLIOGRAPHY: Gehle, *De Bedæ Venerabilis Vita et Scriptis*; Browne, *The Venerable Bede*; C. Plummer's introduction to his edition of the *Historia Ecclesiastica.*

**BEDEGUAR,** or **BEDEGAR** (bed'egär). A spongy excrescence or gall, sometimes termed sweet-brier sponge, found on various species of roses, and produced by several insects as receptacles for their eggs, especially by the *Cynips rosæ.* It was once thought to be a diuretic and vermifuge.

**BEDELL', William.** A celebrated Irish bishop, born in Essex in 1570. In 1604 he went to Venice as chaplain to Sir Henry Wotton, and remained eight years. After holding the living of Horingsheath from 1615-27, he became Provost of Trinity College, Dublin, and in 1629 Bishop of Kilmore and Ardagh, though he resigned the latter of the united sees in 1630. He set himself to reform abuses and promote the spread of Protestantism, procued the translation of the Old Testament into Irish, and by his tact and wisdom conciliated the adherents of both creeds. He underwent a brief imprisonment on the breaking out of the rebellion in 1641, and died in the year following. His biography was written by Bishop Burnet.

**BE'DER WARE.** *See* BIDERY.

**BED'FORD.** A municipal and, un-

til 1918, a parliamentary borough, England, county town of Bedfordshire, on the Ouse. The chief buildings are the law courts, a range of public schools, a large infirmary, county jail, etc., and the churches. The town is rich in charities and educational institutions, the most prominent being the Bedford Charity, embracing grammar and other schools, and richly endowed. There is an extensive manufactory of agricultural implements; lace is also made, and there is a good trade. John Bunyan was born at Elstow, a village near the town, and it was at Bedford that he lived, preached, and was imprisoned. Bedford gives its name to a county parliamentary division. Pop. (1931), 40,573.

**Bedfordshire** or **Beds**, the county, is bounded by Northampton, Bucks, Herts, Cambridge, and Huntingdon; area, 302,942 acres, of which 260,000 are under tillage or in permanent pasture. Chalk hills, forming a portion of the Chilterns, cross it on the south; north of this is a belt of sand; the soil of the vale of Bedford, consisting mostly of clay and loam, is very fertile; and the meadows on the Ouse, Ivel, and other streams furnish rich pasturage. Two-thirds of the soil is under tillage. Besides the usual cereal and other crops, culinary vegetables are extensively cultivated for the London market. Principal manufactures: agricultural implements, and straw-plait for hats, which is made up principally at Dunstable and Luton. The county returns three members to Parliament (divisions: Bedford, Luton, Midlands). Pop. (1931), 220,474.

**BEDFORD, John, Duke of.** One of the younger sons of Henry IV., King of England; famous as a statesman and a warrior. He defeated the French fleet in 1416, commanded an expedition to Scotland in 1417, and was lieutenant of England during the absence of Henry V. in France. On the king's death he became Regent of France, and for several years his policy was as successful as it was able and vigorous, the victory of Verneuil in 1424 attesting his generalship. The greatest stain on his memory is his execution of the Maid of Orleans (Joan of Arc) in 1431. He died in 1435 at Rouen, and was buried in the cathedral of that city.

**BEDFORD LEVEL.** A large tract of marshy land in England, of about 400,000 acres total area, comprising 63,000 in Norfolk, 30,000 in Suffolk, 50,000 in Huntingdon, the Peterborough fen in Northampton, the Holland district in Lincolnshire, and most of the Isle of Ely in Cambridge. It derives its name from Francis, Earl of Bedford, who in 1634 made an agreement with Charles I. for the drainage of the Level, in consideration of receiving 95,000 acres of the reclaimed land. A great part of the Level is under cultivation, and produces grain, flax, and cole-seed; the remainder yields a winter harvest of wild-fowl for the London market. *See* FENLAND.

**BEDFORDSHIRE REGIMENT, The.** Raised in 1688 on the approach of the Prince of Orange, suffered severely at Blenheim, and distinguished itself in a marked manner at the siege of Lille. In 1797 it went to Scotland and there recruited 1000 "parish boys" under sixteen years old, who later made excellent soldiers. The regiment shared in the Chitral and South African (1900-2) campaigns; on going to the front in 1914, sustained heavy losses at Givenchy, and distinguished itself at Ypres and the Aisne.

**BEDIVERE.** The last knight of the Round Table (q.v.). *See* MORTE D'ARTHUR.

**BED'LAM.** A corruption of Bethlehem (Hospital), the name of a religious house in London, converted, after the general suppression by Henry VIII., into a hospital for lunatics. The original Bedlam stood in Bishopsgate Street; its modern successor in St. George's Fields was opened in 1815, having been built on the site of the notorious tavern called "The Dog and the Duck." The lunatics were at one time treated as little better than wild beasts, and hence Bedlam came to be typical of any scene of wild confusion. The average number of patients is about 300.

**BED'LINGTON.** A town and urban district of England, in Northumberland, near the mouth of the Blyth, and not far from the seaport of Blyth, with collieries, ironworks, etc. Pop. (1931), 27,315.

**BEDLINGTON TERRIER.** An English dog, deriving its name from Bedlington, in Northumberland, having first become well known as a favourite among the miners of that place. It is a dog of moderate size, head rather long, with a light, silky tuft on top, ears hanging close to the cheeks, legs moderately long and strong, tail tapering to the point, which is almost bare; colour, dark blue, blue and tan, liver, liver and tan, sandy, or sandy and tan; courageous, intelligent, and generally useful.

**BEDLIS.** *See* BETLIS.

**BEDMAR', Alphonso de la Cueva.** Spanish cardinal, born in 1572; sent in 1607 by Philip III. as ambassador to Venice, and rendered himself famous by an alleged conspiracy with the Milanese and Neapolitan governors to overthrow the Republic of Venice and subject it to Spanish domination (1618). On its discovery Bedmar escaped, and was appointed governor of the Low Countries by the king, and cardinal by the Pope. He died in 1655. The plot is the subject of Otway's *Venice Preserved*.

**BED OF JUSTICE.** *See* LIT DE JUSTICE.

**BEDOUINS** (bed-ụ-ēnz'; Ar. *Bedawi*, pl. *Beduán*, "dwellers of the desert"). A Mahommedan people of Arab race inhabiting chiefly the

Bedouins

deserts of Arabia, Syria, Egypt, and North Africa. They lead a nomadic existence in tents, huts, caverns, and ruins, associating in families under sheikhs or in tribes under emirs. In respect of occupation they are only shepherds, herdsmen, and horse-breeders, varying the monotony of pastoral life by raiding each other and plundering unprotected travellers, whom they consider trespassers. They are ignorant of writing and books, their knowledge being purely traditional and mainly genealogical. They are lax in morals, and unreliable even in respect of the code of honour attributed to them in poetry and fiction. In stature they are undersized, and, though active, they are not strong. The ordinary dress of the men is a long shirt girt at the loins, a black or red and yellow handkerchief for the head, and sandals; of the women, loose drawers, a long shirt, and a large dark, blue shawl covering the head and figure. The lance is their favourite weapon. — BIBLIOGRAPHY: J. L. Burckhardt, *Notes on the Bedouins and Wahabis*; W. S. Blunt, *Bedouin Tribes of the Euphrates*; S. M. Zwemer, *Arabia, the Cradle of Islam*.

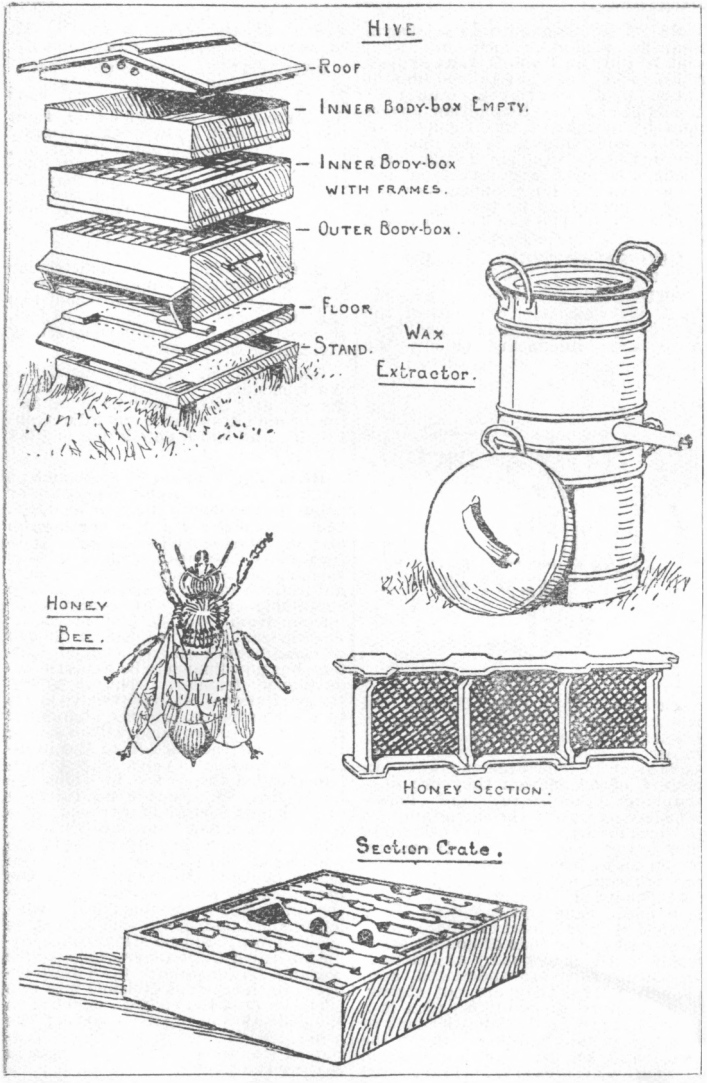
**BED'STRAW.** The popular name of the different species of Galium, a genus of plants, ord. Rubiaceæ. Of the sixteen species found in Britain one of the best known is the Yellow Bedstraw or Cheese-rennet (*G. verum*), so called owing to its property of coagulating milk, a common wayside plant, the flowers and roots of which afford yellow and red dyes. Goose-grass (*G. aparine*) is another well-known member of the genus.

**BEDWELLTY.** An urban district or town of England, Monmouthshire, 7 miles west of Pontypool, with collieries and ironworks. Pop. (1931), 31,089. It gives its name to a parliamentary division of the county.

**BEDWORTH.** An urban district of Warwickshire. It is a coal-mining district and has also some manufacturing industries. It is 100 miles from London and had a population in 1931 of 12,058.

**BEE.** The common name given to a large family of hymenopterous or membranous-winged insects, of which the most important is the common hive or honey bee (*Apis mellifica*). It belongs to the warmer parts of the Eastern Hemisphere, but is now naturalised in the Western. A hive commonly consists of one mother or queen, from 600 to 800 males or drones, and from 15,000 to 20,000 working-bees, formerly termed neuters, but now known to be imperfectly-developed females. The last-mentioned, the smallest, have twelve joints to their antennæ, and six abdominal rings, and are provided with a sting; there is, on the outside of the hind-legs, a smooth hollow, edged with hairs, called the *basket*, in which the kneaded pollen or bee-bread, the food of the larvæ, is stored for transit. The queen has the same characteristics, but is of larger size, especially in the abdomen; she has also a sting. The males, or drones, differ from both the preceding by having thirteen joints to the antennæ; a rounded head, with larger eyes, elongated and united at the summit; and no stings. According to Huber (*New Observations on the Natural History of Bees*) the working-bees are themselves divisible into two classes: one, the *cirières*, devoted to the collection of provisions, etc.; the other, smaller and more delicate, employed exclusively within the hive in rearing the young.

The mouth of the bee is adapted for both masticatory and suctorial purposes, the honey being conveyed thence to the anterior stomach or crop, communicating with a second




BEE-KEEPING

An illustration showing the different sections of a hive, and explaining how the honey is extracted

stomach in which alone a digestive process can be traced. The queen, whose sole office is to propagate the species, has two large ovaries, consisting of a great number of small cavities, each containing sixteen or seventeen eggs. She can lay between 2000 and 3000 eggs in twenty-four hours. The average life of a queen is from two to three years. The inferior half-circles, except the first and last, on the abdomen of working-bees, have each on their inner surface two cavities, where the wax, secreted by the bee from its saccharine food, is formed in layers, and comes out from between the abdominal rings. Respiration takes place by means of air-tubes which branch out to all parts of the body, the bee being exceedingly sensitive to an impure atmosphere. Of the organs of sense the most important are the antennæ, deprivation of these resulting in a species of derangement. The majority of entomologists regard their function as in the first place auditory, but they are exceedingly sensitive to tactual impressions, and are apparently the principal means of mutual communication.

Bees undergo perfect metamorphosis, the young appearing first as larvæ, then changing to pupæ, from which the imagos or perfect insects spring. Whether the offspring are to be female or male is said to be dependent upon the contact or absence of contact of the egg with the impregnating fluid received from the male and stored in a special sac communicating with the oviduct, unfertilised eggs producing males. The further question whether the offspring shall be queens or workers is resolved by the influence of environment upon function. The enlargement of a cell to the size of a royal chamber, and the nourishment of its inmate with a special kind of food, appear to be sufficient to transform an ordinary working-bee larva into a fully-developed female or queen bee.

The season of fecundation occurs about the beginning of summer, and the laying begins immediately afterwards, and continues until autumn; in the spring as many as 12,000 eggs may be laid in twenty-four days. Those laid at the commencement of fine weather all belong to the working sort, and hatch at the end of four days. The larvæ acquire their perfect state in about twelve days, and the cells are then immediately fitted up for the reception of new eggs. The eggs for producing males are laid two months later, and those for the females immediately afterwards. This succession of generations forms so many distinct communities, which, when increased beyond a certain degree, leave the parent hive to found a new colony elsewhere. Thus three or four swarms sometimes leave a hive in a season. A good swarm is said to weigh about 5 lb. Besides the common bee (*A. mellifica*) there are the *A. fasciata*, domesticated in Egypt, the *A. ligustica*, or Ligurian bee of Italy and Greece, introduced into England, etc.

**Humble-bees.** The humble-bees, or bumble-bees, of which about forty species are found in Britain and over sixty in N. America, belong to the genus Bombus, which is almost world-wide in its distribution. Of these species solitary females which have survived the winter commence constructing small nests when the weather begins to be warm enough, some of them going deep into the earth in dry banks, others preferring heaps of stone or gravel, and others choosing always some bed of dry moss. In the nest the bee collects a mass of pollen and in this lays some eggs. The cells in these nests are not the work of the old bee, but are formed by the young insects similarly to the cocoons of silkworms; and when the perfect insect is released from them by the old bee, which gnaws off their tops, they are employed as honey-cups. The humble-bees, however, do not store honey for the winter, those which survive till the cold weather leaving the nest and penetrating the earth, or taking up some other sheltered position, and remaining there till the spring. The first brood consists of workers, and successive broods are produced during the summer.

Some bees, from their manner of nesting, are known as "mason bees," "carpenter bees," and "upholsterer bees." Some of these bees (genus Osmia) cement particles of sand or gravel together with a viscid substance in forming their nests; others make burrows in wood. The leaf-cutter or upholsterer bee (genus Megachile) lines its burrow with bits of leaf cut out in regular shapes. — BIBLIOGRAPHY: Lord Avebury, *Ants, Bees, and Wasps*; Morley, *The Bee People*; M. Maeterlinck, *La vie des abeilles* (English translation by Alfred Sutro); F. C. Pellett, *Productive Bee-keeping*; F. R. Cheshire, *Bees and Bee-keeping*; A. J. Root, *The A.B.C. and X.Y.Z. of Bee-culture*. *See* APIARY.

**BEECH** (Fagus). The common name of trees of the nat. ord. Cupuliferæ, well known in various parts of the world, including New Zealand and Tierra del Fuego. The name is derived from the Anglo-Saxon *boc* or *beoce*, meaning at once a book and a beech tree. The connection of the beech with the graphic arts probably originated in the fact that the ancient

Runic tablets were formed of thin boards of beech wood. The *Fagus sylvatica*, a common European forest tree, sometimes reaching a height of 120 feet, with a diameter of 4 feet or more, is known by its waved and somewhat oval leaves, its triangular fruit enclosed by pairs in a prickly

Beech (*Fagus sylvatica*). Leaves and Inflorescence
1, Ovary. 2, Male flower. 3, Capsule. 4, Fruit.

husk, and by its smooth and silvery bark. The wood is hard and brittle, and if exposed to the air liable soon to decay. It is, however, peculiarly useful to cabinet-makers and turners—carpenters' planes, furniture, sabots, etc., being made of it; and it is durable under water for piles and mill-sluices. The fruit, or *beech-mast*, is used as food for swine, poultry, and other animals. The copper beech is a variety with red cell-sap in the leaf epidermis. The mightiest beech in the world is the great beech at Newbattle Abbey, near Dalkeith, Midlothian, Scotland.

**BEECHAM, Sir Joseph.** Born 1848, died 1916. He was the son of Thomas Beecham, a manufacturer who had founded a pill-making business in Lancashire. Outside his business Sir Joseph was greatly interested in music, and financed several schemes for popularising opera in this country, particularly Russian opera and ballet at Drury Lane. He purchased the Aldwych Theatre, London. Knighted in 1912, he was made a baronet in 1914. His son, Sir Thomas, born in 1879, is a well-known music-conductor and composer.

**BEECHER** (bē'chėr), **Henry Ward.** An eminent American preacher, son of Lyman Beecher (a distinguished clergyman, born 1775, died 1863), born in Connecticut 1813; he was minister at Lawrenceburg, Indiana, 1837, and of Plymouth Congregational Church, Brooklyn, New York, in 1847. The latter pulpit he continued to occupy till his death in 1887, though in 1882 he severed his formal connection with the Congregationalists on the ground of disbelief in eternal punishment. From 1861 to 1863 he was editor of the *Independent*, and for about ten years after 1870 of the *Christian Union*. He was also the author of a considerable number of works, of which his *Lectures to Young Men* (1850), *Life Thoughts* (1858), *Lectures on Preaching* (1872-4), and the weekly issues of his sermons, commanded wide circulation. Few contemporary preachers appealed to as large and diverse a public. His brothers, Charles, Edward, and Thomas, all distinguished themselves as Congregational clergymen. His sister, Catherine Esther (born 1800, died 1878), did much for the education of women, and wrote on this subject and on domestic economy and kindred subjects. Another sister is still better known as Mrs. Beecher-Stowe. *See* STOWE.—Cf. Newell Dwight Hillis, *Henry Ward Beecher: A Study of his Life and Influence*.

**BEECHEY** (bē'chi), **Admiral Frederick William.** Son of Sir William Beechey the painter, born in 1796. In 1818 he accompanied John Franklin on Buchan's Arctic expedition to discover the north-west passage, and the following year took part in a similar enterprise with Parry. In 1821 he was commissioned, with his brother H. W. Beechey, to examine by land the coast of North Africa from Tripoli eastward, an account of which appeared in 1828. From 1825 to 1828 he was commander of the *Blossom* in another Arctic expedition, by way of the Pacific and Behring's Strait, of which a narrative was published in 1831. In 1854 he was made Rear-Admiral of the Blue; he died in 1856.

**BEECHEY, Sir William.** A fashionable portrait-painter, born 1753, died 1839. In 1772 he was elected Royal Academician, and knighted in acknowledgment of his large picture of a cavalry review, including portraits of George III., the Prince of Wales, etc. The complete catalogue of his works includes portraits of nearly all the leading personages of his day, but artistically he does not belong to the first rank of portrait-painters.

**BEECHWORTH.** A town in the north-east of the state of Victoria, about 25 miles south of the Murray;

a well-built place, the centre of a district carrying on gold-mining and other industries. Pop. 8000.

**BEE-EATERS.** A family of Fissirostral Passerine birds, distributed

Bee-eater (*Merops Apiaster*)

over Africa, India, the Moluccas, and Australia; chiefly known in Europe by the *Merops Apiaster*, or common bee-eater, a summer visitant to Russia and the Mediterranean borders. It is rare in Britain. For the most part they nest in colonies, depositing their eggs, like the sand-martins, at the end of a tunnel sometimes 8 or 9 feet long. They are frequently killed for their plumage, which is brownish-red and yellow above, pale-blue on the forehead, yellow at the breast, and green at the wings, tail, and under parts.

**BEEF-EATERS** (usually but erroneously considered a corruption of Fr. *buffetiers*). Yeomen of the guard of the sovereign of Great Britain, stationed by the sideboard at great royal dinners, and dressed after the fashion of the time of Henry VII.

Also a name for certain African insessorial birds (genus Buphâga) which feed on the larvæ embedded in the hides of buffaloes or other large animals.

**BEEFSTEAK CLUB.** The first Beefsteak Club was formed in 1709. The fare was restricted to beer and steaks, and later "The Sublime Society of Steaks" was formed at Covent Garden Theatre. A Beefsteak Club was founded by Sheridan in Dublin in 1749, and the present London one by A. Stuart Wortley in 1875.

**BEEF-WOOD.** The timber of some species of Australian trees belonging to the genus Casuarina, of a reddish colour, hard, and close-grained, with dark and whitish streaks, chiefly used in fine ornamental work.

**BEE-HAWK.** A name given to the honey-buzzard (*Pernis apivorus*), which preys on hymenopterous insects.

**BEE-HAWK MOTH.** The name of two British species of moths (*Macroglossa bombyliformis* and *M. fuciformis*) having translucent wings and hairy bodies.

**BEEHIVE-HOUSES.** The archæological name of primitive dwellings of unknown antiquity found in Scotland and Ireland. They are conical in shape with a hole at the apex. Some of them are ascribed to the Stone Age by Lord Avebury and others, but they are more generally assigned to the period from the seventh to the twelfth century.

**BEEHIVE OVEN.** *See* COKE-OVENS.

Beef-eater

**BEERBOHM, Max.** English writer and caricaturist, born in 1872. He wrote for *The Yellow Book* and published several volumes, including *The Happy Hypocrite* and *Zuleeka Dobson*, and was dramatic critic of *The Saturday Review*. His witty caricatures of celebrities have made his name famous.

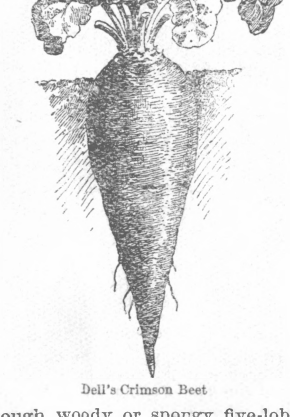
**BEERSHE'BA** (now **BIR-ES-SEBA**,

"the well of the oath.") The place where Abraham made a covenant with Abimelech, and in common speech representative of the southernmost limit of Palestine, near which it is situated. Its position led to the phrase "from Dan to Beersheba" as comprising Hebrew territory from north to south. Beersheba, a Turkish base during the European War (1914-8), was captured by the Australians on 31st Oct., 1917.

**BEESTON.** An urban district or town of England, in Nottinghamshire, 3 miles south-west of Nottingham, with manufactures of hosiery, lace, cycles, etc.; a favourite residential locality with Nottingham business men. Pop. (1931), 16,016.

**BEES-WAX.** A solid fatty substance secreted by bees, and containing in its purified state three chemical principles—myricin, cerin, and cerolcin. It is not collected from plants, but elaborated from saccharine food in the body of the bee. It is used for the manufacture of candles, for modelling, and in many minor processes.

**BEET** (Beta). A genus of plants, nat. ord. Chenopodiaceæ, distinguished by its fruit being enclosed in



Dell's Crimson Beet

a tough woody or spongy five-lobed enlarged calyx. The garden beet (*B. vulgaris*) is a hardy biennial with thick, fleshy roots. Two principal forms are known to cultivators, the chard beet and the common beet. In the chard beet the roots are small, white, and rather tough, and the leaves are furnished with a broad, fleshy midrib (*chard*), employed as a vegetable by the French, who dress the ribs like sea-kale under the name of *poirée*. Various experiments, however, tend to prove that all these plants are forms of a single species. The common beet includes all the fleshy-rooted varieties, such as red beet (with a fleshy large carrot-shaped root), yellow beet, sugar-beet, mangel-wurzel, etc. Red beet is principally used at table, but if eaten in great quantity is said to be injurious.

The beet may be taken out of the ground for use about the end of August, but it does not attain its full size and perfection till the month of October. From the white beet the French, during the Napoleonic wars, succeeded in preparing sugar, that article, as British colonial produce, having been prohibited in France. Since that time, with the increase of chemical and technical knowledge, the making of beet-sugar has become an important industry in France, Germany, Austria, Russia, Belgium, and Holland; Sweden, Spain, Italy, Serbia, Rumania, Bulgaria, and Greece are also growing sugar-beet. It has even been tried in England, and the sugar contained in British-grown beets is not only equal to, but even surpasses that contained in the Continental sugar-beet. The failure, however, of attempts to produce beet-sugar on a large scale in Great Britain seems to have been mainly due to artificial conditions of trade competition. *See* SUGAR.

**BEET-BEETLE** (*Silpha opāca* and *S. atrāta*). The name of two beetles the larva of which, a little black maggot, injures beet and mangel-wurzel by feeding on the leaves.

**BEET-FLY** (*Anthomyia Betæ*). A fly resembling the common fly, but of smaller size, which deposits its eggs in the leaves of mangel-wurzels and other beets. The larvæ, feeding on the tissues, raise bullæ or blisters, which, when numerous, injure the plant.

**BEETHOVEN** (bā'tō-vn), **Ludwig van.** A great German musical composer, born at Bonn, 16th Dec., 1770; studied under his father (a tenor singer), Pfeiffer, Van der Eden, and Neefe; began to publish in 1783. He became assistant Court organist in 1785, and was sent by the Elector of Cologne to Vienna in 1792, where he was the pupil of Haydn and Albrechtsberger, and acquired a high reputation for pianoforte extemporisation before the merit of his written compositions was fully understood. Almost all his subsequent life was spent in or near Vienna, his artistic

tour in North Germany in 1796 being the most important break. He died 27th March, 1827. His later life was rendered somewhat morbid by his deafness, of which the first signs appeared in 1797.

Beethoven

**Works.** His best works were published after 1800, and fall naturally into two periods: the first from 1800 to 1814, comprising *Symphonies 2-8*, the opera *Fidelio* (originally *Leonore*), the music to Goethe's *Egmont*, and the overtures to *Prometheus*, *Coriolanus*, *King Stephen*, and *Fidelio*; the second (in which the poetic school of musicians find the germs of the subsequent development through Schumann, Wagner, and Liszt) comprising the *9th Symphony*, the *Missa Solemnis*, and the *Sonatas Op. 101, 102, 106, 109, 110*, and *111*. An edition of Beethoven's complete works was published by Breitkopf and Härtel (Leipzig, 24 vols., 1864-7).—BIBLIOGRAPHY: A. W. Thayer, *Ludwig van Beethoven's Leben* (5 vols.); W. A. Thomas-San Galli, *Ludwig van Beethoven*; Sir G. Grove, *Beethoven and his Nine Symphonies*; D. G. Mason, *Beethoven and his Forerunners*.

**BEETLE.** A name often used as synonymous with the term Coleoptera, but restricted by others to include only those insects that have their wings protected by hard cases or sheaths, called elytra. Beetles vary in size from a mere point to the bulk of a man's fist, the largest, the elephant beetle of S. America, being 4 inches long. The so-called "black beetles" of kitchens and cellars are not properly beetles at all, but cockroaches, and of the ord. Orthoptera.

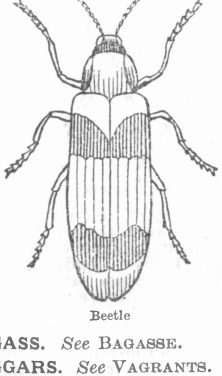
**BEETLE.** A machine or implement used in industry. One form is a kind of hammer with a wooden head, and is used for driving in posts or ramming down paving blocks. A smaller beetle was used in olden days for household purposes. In cotton and linen mills the machine which finishes off the material by hammering it over rollers is called a beetle.

**BEETLE-STONE.** A nodule of coprolitic iron-stone, so named from the resemblance of the enclosed coprolite to the body and limbs of a beetle.

**BEET-ROOT.** *See* BEET.

**BEFA'NA** (It., corrupted from *Epiphania*, "Epiphany"). In Italy, a legendary housewife who, being too busy to see the wise men of the East on their way to the infant Christ, has been looking for them ever since, being ignorant that they returned home another way. She is particularly concerned with children, and on Twelfth-night stockings are hung out to receive her gifts, so that she is not unlike Santa Claus. The name is also given to a ragged doll which appears in the streets and shops on the eve and day of Epiphany.

**BEG,** or **BEY** ("prince" or "lord"). In Turkey, a governor; or more particularly the governor of a sanjak. Sometimes given loosely to superior officers and persons of rank. A bey ranks between an effendi and a pasha.



Beetle

**BEGASS.** *See* BAGASSE.

**BEGGARS.** *See* VAGRANTS.

**BEGGIATOA.** *See* SULPHUR BACTERIA.

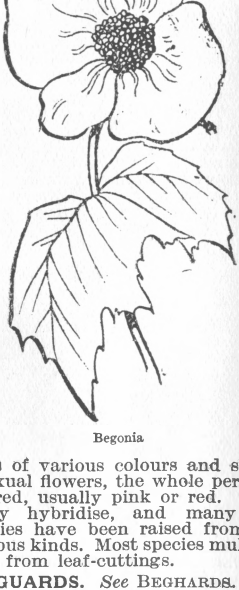
**BEGHARDS** (beg'ärdz), or **BEGUARDS.** Members of a religious body which arose in Flanders in the thirteenth century. They disclaimed the authority of princes, and refused to submit unconditionally to the rules of

any order, but bound themselves to a life of extreme sanctity without necessarily quitting their secular vocations. They were persecuted in the latter half of the fourteenth century as heretics, and either dispersed or distributed over the Dominican and Franciscan orders.

**BEGHARMI** (be-gär′mi). *See* BAGIRMI.

**BEG'LERBEG** ("prince of princes"). The title among the Turks of a governor who has under him several begs, agas, etc.

**BEGO'NIA.** A large genus of succulent herbs, nat. ord. Begoniaceæ, mainly tropical, with fleshy oblique



Begonia

leaves of various colours and showy unisexual flowers, the whole perianth coloured, usually pink or red. They readily hybridise, and many fine varieties have been raised from the tuberous kinds. Most species multiply freely from leaf-cuttings.

**BEGUARDS.** *See* BEGHARDS.

**BEGUINES** (be-gēnz′). An order of females, who, without taking the monastic vows, formed societies for devotion and charity, living in houses called *beguinages*. The word may be derived either from Bega, the patron saint of Nivelles, where the first *beguinage* is said to have been established, or from Lambert le Bègue, who died at Liège in 1180. The order originated, towards the end of the eleventh century, in Germany and the Netherlands, and was very flourishing in the twelfth and thirteenth centuries. They still exist in Holland, Belgium, and Germany, though the modern beguinage is an eleemosynary institution for lodging unmarried women rather than of the old type.

**BE'GUM.** In the East Indies, a princess or lady of high rank.

**BEHAIM′, or BEHEM, Martin.** A mathematician and astronomer, born at Nürnberg in 1436. He went from Antwerp to Lisbon with a high reputation in 1480, sailed in the fleet of Diego Cam on a voyage of discovery (1484-6), and explored the islands on the coast of Africa as far as the Congo. He colonised the Island of Fayal, where he remained for several years, and assisted in the discovery of the other Azores; was afterwards knighted, and returned to his native country, where, in 1492, he constructed a terrestrial globe, still preserved. He died in Lisbon 1506.

**BEHAR′ (or BIHAR) AND ORISSA.** A province of India, constituted in 1912, comprising the Patna, Tirhut, Bhagalpur, Chota Nagpur, and Orissa divisions; area, 83,161 sq. miles. It is generally flat, and is divided into almost equal parts by the Ganges, the chief tributaries of which are the Gogra, Gandak, Kusi, Mahananda, and Soane. There is an extensive canal and irrigation system. Opium and indigo are largely produced. It is the most densely-peopled province of India; pop. 37,590,356.

The town of *Behar*, in the Patna district, contains some ancient mosques and the ruins of an old fort; it is a place of large trade. The capital is Patna; pop. 119,976. The town of Puri contains the famous shrine of Juggernaut.

**BEHAVIOURISM.** A branch of psychology concerned with the objective study of the behaviour of animals and men. The result of this study has shown that there is a similarity in the behaviour of men and animals. C. Lloyd Morgan, the British psychologist, has done a great deal for this science.

**BEHE'MOTH.** The animal described in Job, xl. The description is most applicable to the hippopotamus, and the word is probably of Egyptian origin and signifies "water-ox;" but it has been variously asserted to be the ox, the elephant, the crocodile, etc.

**BE'HEN, Oil of.** *Same as* OIL OF BEN.

**BEHIS'TUN, or BIS'UTUN.** A mountain near a village of the same name in Persian Kurdistan, cele-

brated for the sculptures and cuneiform inscriptions cut upon one of its sides—a rock rising almost perpendicularly to the height of 1700 feet. These works, which stand about 300 feet from the ground, were executed by the orders of Darius I., King of Persia, and set forth his genealogy and victories. To receive the inscriptions the rock was carefully polished and coated with a hard siliceous varnish. Their probable date is about 515 B.C. They were first copied and deciphered by Rawlinson.—BIBLIOGRAPHY: A. V. Williams Jackson, *Persia, Past and Present*; A. H. Sayce, *The Archæology of Cuneiform Inscriptions*.

**BEHN** (ben), **Aphra.** English writer of plays and novels, born 1640; maiden name Johnson. As a child she went out to Surinam, where she became acquainted with the slave Oroonoko, whom she made the subject of a novel. On her return to England she married Mr. Behn, a London merchant of Dutch extraction, but was probably a widow when sent by Charles II. to serve as a spy at Antwerp during the Dutch war. She afterwards became fashionable among the men of wit and pleasure of the time as a prolific writer of plays, poems, and stories, now more notorious for their indecency than their ability. She died in 1689, and was buried in Westminster Abbey. Among her numerous plays are: *The Forced Marriage*, *The Amorous Prince*, *The Town Fop*, and *The Rover*, which is her best. An edition of her works, edited by M. Summers, appeared in 1915.

**BEHRING,** or **BERING** (bā'ring), **Vitus.** A famous navigator, born in 1680 at Horsens, Jutland. The courage displayed by him as captain in the navy of Peter the Great during the Swedish wars led to his being chosen to command a voyage of discovery in the Sea of Kamchatka. In 1728 and subsequently he examined the coasts of Kamchatka, Okhotsk, and the north of Siberia, ascertaining the relation between the north-eastern Asiatic and north-western American coasts. Returning from America in 1741, he was wrecked upon the desert island of Awatska (Behring's Island), and died there.

**BEHRING'S STRAIT, SEA,** and **ISLAND.** The **Strait** is the channel separating the continents of Asia and America, and connecting the North Pacific with the Arctic Ocean; breadth at the narrowest part, between Cape Prince of Wales and East Cape, about 36 miles; depth in the middle from 29 to 30 fathoms. It is frozen in winter, and seldom free from fog or haze. Though named after Vitus Behring, it was only fully explored by Cook in 1778.

**Behring's Sea,** sometimes called the Sea of Kamchatka, is that portion of the North Pacific Ocean lying between the Aleutian Islands and Behring's Strait. A contention between the United States and Great Britain as to the capture of seals in Behring's Sea was finally referred to a court of arbitration, which issued its award in August, 1893, leading to a satisfactory settlement.

**Behring's Island,** the most westerly of the Aleutian chain, off the east coast of Kamchatka. It is uninhabited, and is without wood.

**BEIGE** (bāzh). A light woollen fabric made of wool of the natural colour, that is, neither dyed nor bleached.

**BEILBY, Sir George Thomas.** Scottish chemist and engineer. He was born in 1850 at Edinburgh and educated at the University there. In 1891 he established, at Leith, the first factory in Great Britain for the synthetic production of alkali cyanides. He was also a leading authority on smoke-prevention and fuel economy, and in 1917 was appointed director of the Fuel Research Board. He was knighted in 1916. He died in 1924.

**BEIRA** (bā'i-rà). A province of Portugal, bounded by the Douro, the Tagus, and Estremadura. Area, 9256 sq. miles; pop. 1,663,921. Chief town, Coimbra.

**BEIRA.** A seaport on the east coast of S. Africa, in Portuguese territory, near the mouth of the Pungwe. A railway runs inland to Salisbury, in Southern Rhodesia. Pop. 17,000.

**BEIRAM.** *See* BAIRAM.

**BEIRUT.** *See* BEYROUT.

**BEIT-EL-FAKIH** (bāt-el-fā'kē). A town, Arabia, Yemen, a principal market for Mocha coffee. Pop. 8000.

**BEIT HANUN.** Town of Palestine, near Gaza. It was captured by the British in Nov., 1917, after the battle of Gaza.

**BEITH.** A town of Scotland, in northern Ayrshire, with cabinet-making and other industries. Pop. (1931), 5977.

**BEITH, John Hay.** Better known by his pen-name of "Ian Hay." He was born in 1876, and educated at Fettes and St. John's College, Cambridge. His principal novels are: *Pip* (1907), *A Man's Man* (1909), and *A Knight on Wheels* (1911). His two war books, *The First Hundred Thousand*, and its sequel, *Carrying on after the First Hundred Thousand*, are admirable pictures of the lighter

side of the European War. These were followed by other novels, but he made a greater success with his plays, especially *Tilly of Bloomsbury* and *The Sport of Kings*. With P. G. Wodehouse he wrote *Ba Ba Black Sheep* and *The Damsel in Distress*, and with Stephen King-Hall *The Midshipmaid*.

**BEJA** (bā'zha). A town, Portugal, province of Alemtejo, with an old cathedral and some Roman remains. Pop. 10,521.

**BEJAPOOR'.** A ruined city of India, in the Bombay Presidency, near the borders of the Nizam's dominions, on an affluent of the Krishna. It was one of the largest cities in India until its capture by Aurangzib in 1686. The ruins, of which some are in the richest style of Oriental art, are chiefly Mahommedan, the principal being Mahomet Shah's tomb, with a dome visible for 14 miles, and a Hindu temple in the earliest Brahmanical style. Pop. 32,485.

**BEJAR** (bā-*här'*). A fortified town of Spain, province Salamanca, with woollen manufactures. Pop. 10,000.

**BEKÂA** (be-kā'â). *Same as* CŒLE-SYRIA.

**BEKE** (bēk), **Charles Tilstone.** English traveller, born 1800. He studied law at Lincoln's Inn, and, having devoted much attention to ancient history and kindred subjects, he published, in 1834, *Origines Biblicæ*, researches in primitive history. Supported by private individuals, he joined Major Harris in the exploration of Abyssinia, of which he published an account in 1846. Two works on the Nile followed in 1847 and 1849, with a *Memoir in Defence of Pères Paez and Lobo*, issued in Paris, 1848. He also made journeys to Harran in 1861, to Abyssinia in 1865, and to the head of the Red Sea in 1874, in which year he died.

**BEKES** (bā'kāsh). A town, Hungary, at the junction of the Black and White Körös, with a trade in cattle, corn, wine, etc. Pop. 28,835. For BEKES-CSABA *see* CSABA.

**BEKKER, August Immanuel.** German classical scholar, born 1785, died 1871. His critical editions of the texts of the most important Greek and Latin authors, based on an examination and comparison of MSS., are very valuable, embracing Plato, Aristotle, Aristophanes, Thucydides, Livy, and Tacitus. He also published contributions to the philology of the Romance tongues.

**BEL.** The chief deity of the ancient Babylonians. *See* BABYLON.

**BEL,** also **BELGAR.** The Hindu name of the *Ægle marmēlos*, or Bengal quince. The fruit, which is not unlike an orange, is slightly aperient; a perfume and yellow dye are obtained from the rind, and a cement from the mucus of the seed.

**BELA.** The name of four kings of Hungary belonging to the Arpad dynasty.—**Bela I.,** son of Ladislaf, competed for the crown with his brother Andrew, whom he defeated, killed, and succeeded in 1061. He died 1063, after introducing many reforms. —**Bela II.,** the Blind, mounted the throne in 1131, and, after ruling under the evil guidance of his queen, Helena, died from the effects of his vices in 1141.—**Bela III.,** crowned 1174, corrected abuses, repelled the Bohemians, Poles, Austrians, and Venetians, and died in 1196.—**Bela IV.,** succeeded his father, Andrew II., in 1235; was shortly after defeated by the Tartars and detained prisoner for some time in Austria, where he had sought refuge. In 1244 he regained his throne, with the aid of the Knights of Rhodes, and defeated the Austrians, but was in turn beaten by the Bohemians. Died 1270.

**BELBEIS** (bel'bās). A town, Lower Egypt, 28 miles N.N.E. of Cairo, on the road to Syria. Near it are traces of the ancient canal that joined the Nile to the Red Sea. In the vicinity of Belbeis are the ruins of Bubastis. Pop. 13,485.

**BELCHER, James.** English pugilist, born in 1781. He became one of the leading fighters of the day, and was champion of England for some years. He died in 1811.

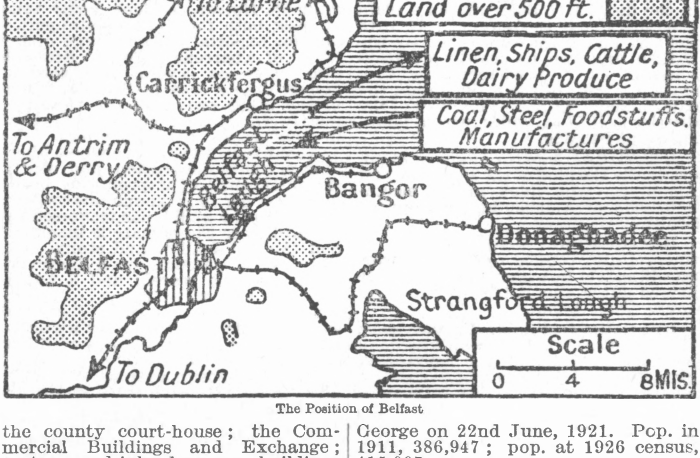
**BELEM** (bā-leṇ'). A town of Portugal, on the right bank of the Tagus, now the fashionable suburb of Lisbon. *See* PARÁ.

**BEL'EMNITE.** A name for straight, solid, tapering, dart-shaped fossils, popularly known as arrow-heads, thunderbolts, finger-stones, etc., but in reality the internal shell or skeleton of a molluscous animal allied to the squid or sepia, and the type of an extinct family, Belemnitidæ. Belemnite is one of the earliest-known fossils, and the shell is supposed to have been known to Pliny, but the name "belemnite" was first applied to it by Georg Agricola in 1546.

**BELFAST'.** A seaport and municipal and parliamentary borough of Ireland (in 1888 declared a city), capital of Northern Ireland, and county town of Antrim, built on low alluvial land on the banks of the Lagan, at the head of Belfast Lough. The streets are spacious and regular, the houses mostly of brick. There are

many handsome places of worship, Presbyterian, Episcopalian, Roman Catholic, and those of other denominations. The chief educational institution is the Queen's University (a fine pile in the later Gothic style), which, founded as Queen's College, a part of the Royal University of Ireland, in 1845, became a university in 1909. It has a staff of 68 professors, lecturers, and demonstrators; and about 700 students are enrolled there.

Among chief public buildings are: the new City Hall (cost about £200,000); the municipal buildings; the county court-house; the Commercial Buildings and Exchange; customs and inland revenue building; post office; county jail; Ulster Hall; Albert Memorial clock-tower, 143 feet high; the Opera House; etc. There are six public parks, some of them extensive, a botanic garden, and a borough cemetery. Belfast Lough is about 12 miles long, and 6 miles broad at the entrance, gradually narrowing as it approaches the town. The harbour and dock accommodation is now extensive.



The Position of Belfast

**Industries.** Belfast is the centre of the Irish linen trade, and has the majority of spinning-mills and power-loom factories in Ireland. Previous to about 1830 the manufacture of cotton was the leading industry of Belfast, but nearly all the mills have been converted to flax-spinning. Iron shipbuilding is of great importance, and there are breweries, distilleries, aerated-water works, tobacco-works, flour-mills, foundries, tan-yards, chemical-works, ropeworks, etc. The commerce is large. An extensive direct trade is carried on with British North America, the Mediterranean, France, Belgium, Holland, and the Baltic, besides the regular traffic with the principal ports of the British Islands. Belfast is comparatively a modern town, its prosperity dating from the introduction of the cotton trade in 1777. It has suffered severely at various times from faction-fights between Catholics and Protestants, the most serious having been in the years 1864, 1872, 1886, and 1920. The first Ulster Parliament was opened by King George on 22nd June, 1921. Pop. in 1911, 386,947; pop. at 1926 census, 415,007.

**BELFORT**, or **BÉFORT** (bā-fōr). A small fortified town and territory of France, in the former department of Haut Rhin, on the Savoureuse, well built, with an ancient castle and a fine parish church. In the Franco-German War it capitulated to the Germans only after an investment of more than three months' duration (1870-71). It has since been greatly strengthened. Belfort, with the district immediately surrounding it, was the only part of the department of Haut Rhin which remained to France on the cession of Alsace to Germany. Area, 235 sq. miles. Pop. of territory (1926), 99,403; of town, 42,511.

**BELGA.** A currency unit of Belgium, equal to 5 francs. Thirty-five belgas go to the pound sterling. It was introduced when the Belgian currency was stabilised in 1926, and

its use is compulsory in foreign exchange transactions.

**BEL'GÆ.** A collection of German and Celtic tribes who at one time inhabited the country extending between the Marne and Seine and the Lower Rhine, and bounded northwest by the sea. Cæsar, on his invasion of Britain, found them established also in Kent and Sussex.

**BEL'GARD.** A town of Prussia, province of Pomerania, 15 miles south of the Baltic, with an old castle. Pop. 12,478.

**BELGAUM** (bel-gä'ụm). A town and fortress in India, Bombay Presidency, in the district of Belgaum, on a plain 2500 feet above the sea-level. In 1818 the fort and town were taken by the British, and from its healthy situation selected as a permanent military station. Pop. of town (including the cantonment), 48,320.—The area of the district is 4657 sq. miles, with a population of 943,820.

**BEL'GICA.** A part of ancient Gaul, originally the land of the Bellovăci and Atrebătes, who lived in the neighbourhood of Amiens, and perhaps of Senlis.

**BELGIOJOSO** (bel-jo-yō'so). A town, Italy, province of Pavia, with an old castle in which Francis I. was lodged after the battle of Pavia in 1525. Pop. 4500.

**BELGIUM** (bel'jum; Fr. *Belgique*; Ger. *Belgien*). A European kingdom, bounded by Holland, the North Sea, France, and Germany; greatest length, 165 miles; greatest breadth, 120 miles; area, 11,755 sq. miles. For administrative purposes it is divided into nine provinces—Antwerp, Brabant, East Flanders, West Flanders, Hainaut, Liège, Limburg, Luxemburg, and Namur. The population at the 1920 census was 7,465,782; pop. (1930), 8,092,004. Brabant, the metropolitan province, occupies the centre. The capital is Brussels; other chief towns are Antwerp, Ghent, and Liège.

The country may be regarded roughly as an inclined plain, falling away in height from the southern district of the Ardennes until in the N. and W. it becomes only a few feet above sea-level. The surface rocks in the south consist of slate, old red sandstone, and mountain limestone; towards the N.W. a coal-and-iron-field stretches across the provinces of Hainaut and Liège, skirting those of Namur and Luxemburg. North and west of this coal-field a more recent formation is found, covered inland by deep beds of clay and on the coast by sand-dunes. The chief rivers are the Scheldt or Schelde and Meuse or Maas, which cross the country in a north-easterly direction; other navigable streams are the Dender, Dyle, Lys, Ourthe, Rupel, and Sambre. There are also a number of canals. The climate bears a considerable resemblance to that of the same latitudes in England; healthiest in Luxemburg and Namur, unhealthiest in the fens of Flanders and Antwerp.

About one-sixth of the whole surface of the kingdom is occupied by wood, Luxemburg and Namur being very densely wooded. These woods, the remains of the ancient forest of Ardennes, consist of hard wood, principally oak, and furnish valuable timber, besides many tons of bark both for the home-tanneries and for exportation, and large quantities of charcoal. South Brabant also possesses several fine forests, among others that of Soignies; but in the other provinces the timber—mostly varieties of poplar—is grown in small copses and hedgerows.

About four-fifths of the whole kingdom is under cultivation, and nearly eleven-twelfths of it profitably occupied, leaving only about one-twelfth waste. In the high lands traversed by the Ardennes the climate is ungenial, and the soil shallow and stony. On the natural pastures here, however, much stock is reared, and a hardy breed of horses, while vast herds of swine feed in the forests. Where the soil is arable it is turned to account, and the vine has been grown with fair success in some districts.

In the opposite extremity of Belgium is an extensive tract known as the Campine, composed for the most part of barren sand, with here and there a patch of more promising appearance. Agricultural colonies, partly free and partly compulsory, have been planted in different parts of this district with considerable success, some of the finest cattle and much excellent dairy produce coming from it. But a portion of it remains untouched.

With exception of the two districts now described, there is no part of Belgium in which agriculture does not flourish; but it is most highly developed in E. and W. Flanders. Flemish husbandry partakes more of the nature of garden than of field culture, being very largely spade-farming. The chief corn crops are wheat (about 400,000 acres), rye, and oats (650,000 to 700,000 acres each); but they do not suffice for the wants of the country. The chief green crops are potatoes, beet (partly for sugar), and flax, the last a most valuable crop in the Flemish rotation. The cattle are good and numerous. The horses of Flanders are admirably

adapted for draught, and an infusion of their blood has contributed not a little to form the magnificent teams of the London draymen.

The minerals of Belgium are highly valuable. They are almost entirely confined to the four provinces of Hainaut, Liège, Namur, and Luxemburg, and consist of iron and coal, lead, manganese, and zinc, the first two minerals being far the most important. The iron-working district lies between the Sambre and the Meuse, and also in the province of Liège. At present the largest quantity of ore is raised in that of Namur. The coal-field has an area of above 500 sq. miles. The quantity of coal raised annually is about 23,000,000 tons. The export, chiefly to France, is over 7,000,000 tons. Belgium is also abundantly supplied with building-stone, pavement limestone, roofing-slate, and marble.

**Industries.** The industrial products of Belgium are very numerous, and are mostly of good quality. The chief are those connected with linen, wool, cotton, metal, and leather goods. In respect of manufactures, the fine linens of Flanders and lace of South Brabant are of European reputation. Scarcely less celebrated are the carpets and porcelain of Tournai, the cloth of Verviers, the extensive foundries, machine-works, and other iron establishments of Liège. The commerce of Belgium is large and increasing. Apart from the value of her own products, she is admirably situated for the transit trade of Central Europe, to which her fine harbour of Antwerp and excellent railway and canal system minister.

The exports of Belgian produce and manufactures, which in 1840 were valued at £5,600,000, have risen to over £150,000,000. The imports for home consumption amount to some £160,000,000. The transit trade is valued at over £70,000,000. The articles of import are chiefly cereals, raw cotton, wool, and colonial produce; those of export principally coal, iron and steel, and metal goods, flax, cottons, linens, and woollens, glass, etc. The total imports for 1927 were valued at £166,740,000, the exports at £152,200,000. The exports to Great Britain in 1927 were to the value of about £46,489,000; the imports from Great Britain into Belgium to about £16,468,000. The external trade is chiefly carried on by means of foreign vessels, by far the greatest number of which are British. The total burden of the Belgian mercantile marine in 1926 was about 342,000 tons. In 1926 the railways had a total length of 5959 miles, about half of this mileage belonging to the State.

**Population.** The Belgian population is the densest of any European State (688 per square mile), and is composed of two distinct races—Flemish, who are of German, and Walloons, who are of French extraction. The former, by far the more numerous, have their principal locality in Flanders; but also prevail throughout Antwerp, Limburg, and part of South Brabant. The latter are found chiefly in Hainaut, Liège, Namur, and part of Luxemburg. The Flemings speak a dialect of German, and the Walloons a corruption of French, with a considerable infusion of words and phrases from Spanish and other languages. French is the official and literary language, though Flemish is also successfully employed in literature. Almost the entire population is Roman Catholic, and there are over 2400 convents, with nearly 37,000 inmates. Protestantism is fully tolerated, and even salaried by the State, but cannot count more than 30,000 adherents.

Improved means of education are now at the disposal of the people, every commune being bound to maintain at least one school for elementary education, the Government paying one-sixth, the province one-sixth, and the commune the remainder of the expenditure. In all the large towns colleges (*athénées*) have been established; while a complete course for the learned professions is provided by four universities, two of them, at Ghent and Liège, established and supported by the State; one at Brussels, the Free University, founded by voluntary association; and one at Louvain, the Catholic University, founded by the clergy. Although the condition of the population is, for the most part, one of comfort, yet in Flanders and South Brabant, where there is great density, a fourth of the people is dependent on total or occasional relief.

**Legislation.** By the Belgian constitution the executive power is vested in a hereditary king; the legislative, in the king and two chambers—the Senate and the Chamber of Representatives—the former elected for eight years, and the latter for four, but one-half renewable respectively every four years and every two years. There is now a system of proportional representation both for the Senate and the Chamber. Representatives are elected on the principle of manhood suffrage, but certain property or educational qualifications may give a voter three votes. The Senators are partly elected directly, partly indirectly, by Provincial Councils. Senators must be forty years of age, Deputies and Electors twenty-five. The total

number of Senators is 153, of whom 27 are elected by the Provincial Councils; that of the Deputies 186, in the proportion of 1 to every 40,000 inhabitants (Law of May, 1912). Every Deputy has an annual indemnity of 4000 francs (£160) and travels free. The Chamber which was elected in 1925 contained 78 Clericals and 79 Socialists.

By the new military law of 1923 the army is recruited by means of annual calls to the colours and by voluntary enlistments, the former consisting of 49 per cent of those inscribed on the rolls. Military service is compulsory for those called to the colours. During the European War (1914-18) compulsion was enforced on men between the ages of 18 and 40. The peace strength is about 80,000 officers and men; in time of war, 163,000. Besides this standing army, there is a *garde civique* numbering 40,000 partly active, partly non-active men. The navy has been abolished, except for one fishery cruiser.

The estimated revenue for 1928, chiefly from railways, customs, excise, and direct taxes, was £60,000,000; the estimated expenditure, £110,000,000. The Belgian national debt amounted in December, 1927, to a total of about £315,000,000. This sum includes £20,000,000 borrowed in 1926 for the purpose of stabilising the franc. The coins, weights, and measures are the same, both in name and value, as those of France. In 1926 the belga (35 belgas=£1 stg.) became the unit of account for public transactions.

**History.** The territory now known as Belgium originally formed only a section of that known to Cæsar as the territory of the Belgæ, extending from the right bank of the Seine to the left bank of the Rhine, and to the ocean. This district continued under Roman sway till the decline of the Empire; subsequently formed part of the kingdom of Clovis; and then of that of Charlemagne, whose ancestors belonged to Landen and Herstal on the confines of the Ardennes. After the breaking up of the empire of Charlemagne, Belgium formed part of the kingdom of Lotharingia under Charlemagne's grandson, Lothaire; Artois and Flanders, however, belonged to France by the Treaty of Verdun.

For more than a century this kingdom was contended for by the kings of France and the emperors of Germany. In 953 it was conferred by the Emperor Otto upon Bruno, Archbishop of Cologne, who assumed the title of archduke, and divided it into two duchies: Upper and Lower Lorraine. In the frequent struggles which took place during the eleventh century, Luxemburg, Namur, Hainaut, and Liège usually sided with France, while Brabant, Holland, and Flanders commonly took the side of Germany. The contest between the civic and industrial organisations and feudalism, which went on through the twelfth and thirteenth centuries, and in which Flanders bore a leading part, was temporarily closed by the defeat of the Ghentese under van Artevelde in 1382. In 1384 Flanders and Artois fell to the House of Burgundy, which in less than a century acquired the whole of the Netherlands. The death of Charles the Bold at Nancy, in his attempt to raise the duchy into a kingdom (1477), was followed by the succession and marriage of his daughter, Mary of Burgundy, by which the Netherlands became an Austrian possession. With the accession, however, of the Austrian House of Habsburg to the Spanish throne, the Netherlands, after a brief period of prosperity attended by the spread of the reformed religion, became the scene of increasingly severe persecution under Charles V. and Philip II. of Spain. Driven to rebellion, the seven northern States, under William of Orange, the Silent, succeeded in establishing their independence, but the southern portion, or Belgium, continued under the Spanish yoke.

From 1598 to 1621 the Spanish Netherlands were transferred as an independent kingdom to the Austrian branch of the family by the marriage of Isabella, daughter of Philip II., with the Archduke Albert of Austria. He died childless, however, and they reverted to Spain. After being twice conquered by Louis XIV., conquered again by Marlborough, coveted by all the Powers, deprived of territory on the one side by Holland and on the other by France, the Southern Netherlands were at length in 1714, by the Peace of Utrecht, again placed under the dominion of Austria, with the name of the Austrian Netherlands. During the Austrian War of Succession the French under Saxe conquered nearly the whole country, but restored it in 1748 by the Peace of Aix-la-Chapelle. The Seven Years' War (1756-63) did not affect Belgium, and in that period, and during the peace which followed, she regained much of her prosperity under Maria Theresa and Charles of Lorraine. On the succession of Joseph II., the "philosophic emperor," a serious insurrection occurred, the Austrian army being defeated at Turnhout, and the provinces forming themselves into an independent State as United Belgium (1790). They had scarcely been subdued again by Austria before they were conquered by the revolutionary armies of France, and the country divided

into French departments, the Austrian rule being practically closed by the battle of Fleurus (1794), and the French possession confirmed by the Treaties of Campo Formio (1797) and Lunéville (1801).

In 1815 Belgium was united by the Congress of Vienna to Holland, both countries together now forming one State, the kingdom of the Netherlands. This union lasted till 1830, when a revolt broke out among the Belgians, and soon attained such dimensions that the Dutch troops were unable to repress it. A convention of the Great Powers, assembled in London, favoured the separation of the two countries, and drew up a treaty to regulate it; the National Congress of Belgium offering the crown, on the recommendation of England, to Leopold, Prince of Saxe-Coburg, who acceded to it under the title of Leopold I., on 21st July, 1831. In November of the same year the five Powers guaranteed the crown to him by the Treaty of London, and the remaining difficulties with Holland were settled in 1839, when the Dutch claims to territory in Limburg and Luxemburg were withdrawn. By the Treaty of London the neutrality of Belgium was guaranteed by Great Britain, Austria, France, Prussia, and Russia.

The reign of Leopold was for Belgium a prosperous period of thirty-four years. Leopold II. succeeded his father in 1865. The chief feature of Belgian politics during the reign of Leopold II. was a keen struggle between the Clerical and the Liberal parties. Till 1878 the Clerical party maintained the upper hand, but to a large extent by corruption at the elections. In 1877 a Bill was passed to put down corruption, and to increase the number of town Deputies to the Chamber of Representatives; and at the next elections, in June, 1878, the Liberals gained a majority, which they lost in 1884. The Clerical party continued in power till 1894, when it again obtained a large majority. In 1893 a Bill giving an extension of the franchise was passed. Leopold II. was succeeded by his nephew, Albert, in 1909. In July, 1914, Germany invaded Belgium, occupying Brussels on 20th Aug., Antwerp on 9th Oct., and Ostend on 15th Oct. On 13th Oct. the Belgian Government withdrew to Le Havre in France. (*See* EUROPEAN WAR.) After the signing of the armistice with Germany, Belgium was faced with the problem of reconstruction, which meant not only the furnishing of goods, but the complete rebuilding of trade and commerce and the reconstruction of the devastated towns and areas. In 1918 a company was formed, the "Comptoir National pour la Reprise de l'Activité Economique en Belgique," under the control of the Belgian Government, for assisting in the economic reconstruction of the country.

Another of her post-war problems was the settling of a dispute with Holland regarding the navigation of the Schelde; an agreement was made, however, in 1925, granting free navigation to all vessels except battleships in time of war.

Notable also has been the rise of the Belgian Workman's Party or *Parti Ouvrier Belge*, a political organisation, under the leadership of Emile Vandervelde. Among their aims are vocational education, insurance, and shorter military service.

Government elections are based on the proportional representation system. In 1925 it was proposed to extend the vote to women, but the motion was defeated, and at the general election of the same year the *Parti Ouvrier Belge* or Socialists gained an overwhelming majority. A Socialist-Catholic Government was set up by Viscount Pouillet, and Vandervelde was made Foreign Minister. On behalf of his country he signed the Lucerne Pact and continued in office under the Catholic Government formed later by Henri Jaspar; on the dissolution of the Government, hastened by repeated demands on the part of the Socialists for a shorter term of military service, he and his colleagues were put out of office.—BIBLIOGRAPHY: L. Balan, *Soixante-dix ans d'histoire de Belgique*; Moke and Hubert, *Histoire de Belgique*; H. Charriant, *La Belgique moderne*; D. C. Boulger, *Belgium and the Belgians*; Clive Holland, *The Belgians at Home*; R. Ingpen, *The Glory of Belgium*; A. S. Rappoport, *Brave Belgium*; R. Billiard, *La Belgique industrielle et commerciale de demain*; L. van der Essen, *A Short History of Belgium*.

**BEL'GOROD.** *See* BIELGOROD.

**BELGRADE** (bel-grād'). Capital of Yugoslavia, in Serbia, on the Danube in the angle formed by the junction of the Save with that river, consisting of the citadel or upper town, on a rock 100 feet high, and the lower town, which partly surrounds it. Of late years buildings of the European type have multiplied, and the older ones have been suffered to fall into decay. The chief are the royal and episcopal palaces, the Government buildings, the cathedral, barracks, bazaars, national theatre, the university, founded in 1838, and various educational institutions. It manufactures

carpets, silk stuffs, hardware, cutlery, and saddlery ; and carries on an active trade. Being the key of Hungary, it was long an object of fierce contention between the Austrians and the Turks, remaining, however, for the most part in the hands of the Turks until its evacuation by them in 1867. Since the Treaty of Berlin (July, 1878) it has been the capital of an independent State. Belgrade was captured by the Austrians on 2nd Dec., 1914, recovered by the Serbians on the 14th, and again occupied by the Austro-Germans on 9th Oct., 1915. The Serbians re-entered the town on 1st Nov., 1918. Pop. (1931), 291,738.

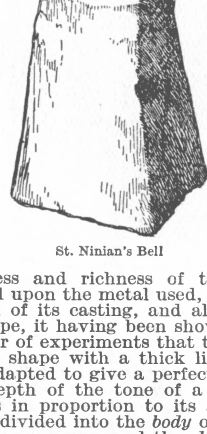
**BELGRAVIA.** A district of London not far from Victoria Station. Belgrave Square, from which it takes its name, is in it.

**BELISA'RIUS** (Slav. *Beli-tzar*, "White Prince"). The general to whom the Emperor Justinian chiefly owed the splendour of his reign, born in Illyria about A.D. 505. He served in the bodyguard of the Emperor, soon after obtained the chief command of an army on the Persian frontiers, and in 530 gained a victory over a superior Persian army. The next year, however, he lost a battle, and was recalled. In the year 532 he checked the disorders in Constantinople arising from the Green and Blue factions, and was then sent with 15,000 men to Africa to recover the territories occupied by the Vandals. He took Carthage and led Gelimer, the Vandal king, in triumph through Constantinople. Dissensions having arisen in the Ostrogothic kingdom, he was sent to Italy, and, though ill supplied with money and troops, stormed Naples, held Rome for a year, took Ravenna, and led captive Vitiges, the Gothic king.

He rendered honourable service in later campaigns in Italy and against the Bulgarians, but was accused of conspiracy and flung into prison. He afterwards seems to have recovered his property and dignities, the story of Tzetzes (a twelfth-century monk), that Belisarius wandered about as a blind beggar, being probably an invention. He died in 565. The only weaknesses in the character of Belisarius appear in connection with his profligate wife, Antonina, an associate of the Empress Theodora.—BIBLIOGRAPHY : T. Hodgkin, *Italy and Her Invaders* ; J. B. Bury, *Later Roman Empire* ; Gibbon, *Decline and Fall of the Roman Empire*.

**BELIZE** (be-lēz'). The capital and only trading port of British Honduras, at the mouth of the River Belize. Exports : chiefly mahogany, logwood, coco-nuts, and sugar. It was devastated by a hurricane in September, 1931. Pop. 14,000.

**BELL.** A hollow, somewhat cup-shaped, sounding instrument of metal. The metal from which bells are usually made (by founding) is an alloy, called bell-metal, commonly composed of eighty parts of copper and twenty of tin. The proportion of tin varies, however, from one-third to one-fifth of the weight of the copper, according to the sound required, the size of the bell, and the impulse to be given. The



St. Ninian's Bell

clearness and richness of the tone depend upon the metal used, the perfection of its casting, and also upon its shape, it having been shown by a number of experiments that the well-known shape with a thick lip is the best adapted to give a perfect sound. The depth of the tone of a bell increases in proportion to its size. A bell is divided into the *body* or *barrel*, the *ear* or *cannon*, and the *clapper* or *tongue*. The *lip* or *sound-bow* is that part where the bell is struck by the clapper.

It is uncertain whether the jangling instruments used by the Egyptians and Israelites can be correctly described as bells ; but it is certain that bells of a considerable size were in early use in China and Japan, and that the Greeks and Romans used them for various purposes. They are said to have been first introduced into Christian churches about A.D. 400 by Paulinus, Bishop of Nola, in Campania (whence *campana* and *nola* as old names of bells) ; as Paulinus himself, however, in the minute description which he has left of his own church, makes no mention of bells, this is very improbable. Anyhow, their adoption on a wide scale does not become apparent until after the year 550, when they were introduced into France. Benedict Biscop, Abbot of

Wearmouth, seems to have imported bells from Italy to England in 680, but their use in Ireland and Scotland is probably of earlier date.

The oldest of those existing in Great Britain and Ireland, such as the "bell of St. Patrick's will" (*Clogan-eadhachta Phatraic*), and St. Ninian's bell, are quadrangular and made of thin iron plates hammered and riveted together. Until the thirteenth century they were of comparatively small size, but after the casting of the Jacqueline of Paris (6½ tons), in 1400, their weight rapidly increased. Among the more famous bells are the bell of Cologne, 11 tons, 1448; of Dantzig, 6, 1453; of Halberstadt, 7½, 1457; of Rouen, 16, 1501; of Breslau, 11, 1507; of Lucerne, 7½, 1636; of Oxford, 7½, 1680; of Paris, 12½, 1680; of Bruges, 10½, 1680; of Vienna, 17¾, 1711; of Moscow (the monarch of all bells), 193, 1736; three other bells at Moscow ranging from 16 to 31 tons, and a fourth of 80 tons cast in 1819; the bell of Lincoln (Great Tom), 5½, 1834; of York Minster (Great Peter), 10¾, 1845; of Montreal, 13½, 1847; of Westminster (Big Ben), 15½, 1856, (St. Stephen), 13½, 1858; the Great Bell of St. Paul's, 17½, 1882. Others are the bells of Ghent (5); Görlitz (10¾); St. Peter's, Rome (8); Antwerp (7½); Olmutz (18); Sacred Heart, Paris (27); Novgorod (31); Pekin (53½).

**Bells,** on shipboard, are the strokes of the ship's bell which mark the hours. Eight bells are struck at noon and every fourth hour afterwards, i.e. at 4, 8, 12 o'clock, and so on. At 12.30, 1 bell is struck; at 1 o'clock, 2 bells; at 1.30, 3 bells, etc., the series recommencing with 1 bell at 4.30. The time from 4 a.m. to 6 a.m. (the first dog watch) is marked as usual, but from 6 a.m. to 8 a.m. (the second dog watch) the bells are 1 bell at 6.30, 2 bells at 7, 3 bells at 7.30, and 8 bells at 8. The even numbers of strokes thus always announce hours.—BIBLIOGRAPHY: Briscoe, *Curiosities of the Belfry*; Rev. G. S. Tyack, *A Book about Bells*; Dr. J. J. Raven, *The Bells of England* (in the Antiquary's Books Series); J. Berthele, *Enquêtes Campanaires*; H. B. Walters, *Church Bells of England*; T. H. Myres, *Bells and Bell Lore*.

**BELL, Alexander Graham.** Inventor of the telephone; born at Edinburgh, 1847. He was educated at Edinburgh and in Germany, and settled in Canada in 1870. In 1872 he went to the United States and introduced for the education of deaf-mutes the system of visible speech contrived by his father, Alexander Melville Bell. He became professor of vocal physiology in Boston University, and exhibited his telephone, designed and partly constructed some years before, at the Philadelphia exhibition in 1876. He invented the photophone, and in 1885 patented an instrument which he called the "graphophone," one of the earliest talking-machines. He was awarded the Volta Prix in 1881, the Prince Albert Medal in 1902, and the Hughes Medal of the Royal Society in 1913. *See* TELEPHONE. He died in Aug., 1922.

**BELL, Sir Charles.** Anatomist and surgeon. He was born at Edinburgh in 1774, and studied anatomy there under the superintendence of his brother John (q.v.). In 1804 he went to London, and soon distinguished himself as a lecturer on anatomy and surgery. In 1814 he was appointed surgeon to the Middlesex Hospital, and in 1821 he communicated to the Royal Society a paper on the nervous system, containing among other things the important discovery that the nerve-filaments of sensation are distinct from those of motion. It at once attracted general attention and established his reputation. In 1824 he accepted the chair of anatomy and surgery in the London College of Surgeons, and in 1836 that of surgery in the University of Edinburgh. He died suddenly in 1842. He was the author of many professional works of high repute on anatomy and surgery, and of a Bridgewater Treatise, *The Hand: its Mechanism and Vital Endowments as evincing Design*. He received the honour of knighthood in 1831.

**BELL, George Joseph.** Brother of Sir Charles and John Bell (q.v.), an eminent lawyer. Born in Edinburgh in 1770, died 1843. He is the author of several standard law-books, the most important of which is *The Principles of the Law of Scotland*, which has gone through several editions.

**BELL, Gertrude Margaret Lowthian.** English traveller, educated at Oxford. She travelled in Arabia, gaining an intimate knowledge of the country. During the Great War she served in the Intelligence Department in Iraq, and later was a political officer in Bagdad. She died in 1926. Her *Letters*, edited by her stepmother, Lady Bell, were published in 1926.

**BELL, Henry.** The first successful applier of steam to the purposes of navigation in Europe. Born in Linlithgowshire 1767, died at Helensburgh 1830. He was apprenticed as a millwright, and afterwards served

under several engineers, including Rennie. He settled in Glasgow in 1790, and subsequently in Helensburgh. In 1798 he turned his attention specially to the steamboat, the practicability of steam navigation having been already demonstrated. In 1812 the *Comet*, a small 30-ton vessel built at Glasgow under Bell's directions, and driven by a 3-h.p. engine made by himself, commenced to ply between Glasgow and Greenock, and continued to run till she was wrecked in 1820. This was the beginning of steam navigation in Europe. It has been asserted that Fulton, who started a steamer on the Hudson in 1807, obtained his ideas from Bell in the previous year. Bell is also credited with the invention of the "discharging machine" used by calico-printers. A monument has been erected to his memory at Dunglass Point, on the Clyde.

**BELL, Henry Glassford.** Poet, miscellaneous writer, and lawyer; born in Glasgow 1803, died 1874. He was educated at the Glasgow High School and Edinburgh University. In 1828 he became editor of the *Edinburgh Literary Journal*, which had a short but brilliant career. In 1832 he was called to the Bar, and in 1836 competed with Sir W. Hamilton for the chair of logic and metaphysics in Edinburgh University. In 1839 he was appointed Sheriff-substitute of Lanarkshire, and in 1867 Sheriff-principal. He was the author of several volumes of poetry, a *Life of Mary Queen of Scots*, etc.

**BELL, James.** Scottish geographical writer, born 1769, died 1833. His first literary work was on the *Glasgow Geography*, a popular work of the period, which was in 1822, chiefly by his labours, extended to 5 vols. It formed the basis of his principal work, *A System of Popular and Scientific Geography*, published at Glasgow in 6 vols. His *Gazetteer of England and Wales* was in the course of publication at the time of his death.

**BELL, John.** A distinguished surgeon, elder brother of Sir Charles Bell, born in Edinburgh 1763, died at Rome 1820. After completing his professional education, he travelled for a short time in Russia and the north of Europe, and on his return to Edinburgh began to deliver extra-mural lectures on surgery and midwifery. These lectures, which he delivered between the years 1786 and 1796, were very much appreciated, and speedily brought him into an extensive practice as a consulting and operating surgeon. His principal works are: *The Anatomy of the Human Body, Discourses on the Nature and Cure of Wounds, The Principles of Surgery*, and *Letters on Professional Character*, etc.

**BELL, John.** English sculptor, born at Norfolk 1811. His best-known works are: *The Eagle Slayer, Una and the Lion, The Maid of Saragossa, Imogen, Andromeda*, statues of Lord Falkland, Sir Robert Walpole, Newton, Cromwell, etc., and the Wellington Memorial in Guildhall. He was also one of the sculptors of the Guards' Monument in Waterloo Place, London, and the Prince Consort Memorial in Hyde Park. He was the author of several professional treatises, and of a drama, *Ivan: a Day and a Night in Russia*. He died in 1893.

**BELL, Robert.** Journalist and miscellaneous writer, born in Cork 1800, died in London 1867. He settled in London in 1828, edited *The Atlas* for several years, and afterwards *The Monthly Chronicle, Mirror*, and *Home News*. He compiled several volumes of Lardner's *Cabinet Cyclopædia*; but he is best known by his annotated edition of the *British Poets*, the first volume of which appeared in 1854, and which was carried through 29 vols. He also wrote several plays and novels.

**BEL'LA, Stefano Della.** An engraver, born at Florence in 1610, died 1664. In 1642 he went to Paris, where he was employed by Cardinal Richelieu. He returned to Florence and became the teacher in drawing of Cosmo de' Medici. It is said that he engraved 1400 plates.

**BELLADON'NA, or DEADLY NIGHTSHADE.** *Atrōpa Belladonna*, nat. ord Solanaceæ, a British plant. All parts contain hyoscyamine, atropine, and other poisonous alkaloids, and the incautious eating of the brownish-black, shining berries has caused many fatalities. Various preparations of the plant are used in medicine, both internally, especially in nervous ailments, and externally as a means of dilating the pupil of the eye. The name signifies "beautiful lady," and probably refers to the use of the plant as a cosmetic. A curious fact about belladonna is that opium acts as an antidote to it and vice versa.

**BELLADONNA LILY.** So called on account of its beauty, a species of Amaryllis (*A. Belladonna*) with delicate red flowers clustered at the top of a leafless flowering stem. It is a native of the Cape of Good Hope.

**BELLAGIO** (bel-lā'jō). A small town in North Italy, charmingly situated on the rocky tongue of land at which the two southern arms of the Lake of Como branch off, a great

resort of tourists, with many fine hotels, villas, etc. Pop. 3660.

**BELLAIRE.** A town of the United States, Ohio, 5 miles below Wheeling, on the Ohio; numerous manufacturing works. Pop. 13,327.

**BELLAMY, Edward.** Born 1850, died 1898, an American writer, known chiefly by a romance entitled *Looking Backward: 2000-1887*, published in 1888, giving an attractive picture of a state of society that he thought might be realised in the future by well-directed communistic or socialistic efforts. The book had an extraordinary sale in various forms, and was translated into a great many languages. *Equality*, a sequel to *Looking Backward*, was published in 1897.

**BELLAMY** (bel'ă-mī), **Jacobus.** A Flemish poet. Born at Flushing in the year 1757, and died in 1786. A volume of sentimental and anacreontic poems was published in 1782, and was followed in 1785 by a collection of his patriotic songs under the title *Vaderlandsche Gezangen*, which secured him a place among the first poets of his nation. He ranks as one of the restorers of modern Dutch poetry.

**BELL-ANIMALCULE.** *See* VORTICELLA.

**BELLARMI'NO, Roberto.** A cardinal and celebrated controversialist of the Roman Church, born at Monte Pulciano in Tuscany in 1542, died at Rome 1621. He was ordained a priest in 1569 by Jansenius, Bishop of Ghent, and placed in the theological chair of the University of Louvain. He was made a cardinal, on account of his learning, by Clement VIII., and in 1602 created Archbishop of Capua. Paul V. recalled him to Rome, on which he resigned his archbishopric without retaining any pension on it as he might have done. Bellarmino, whose life was a model of Christian asceticism, is one of the greatest theologians, particularly in polemics, that the Church of Rome has ever produced. He had the double merit with the Court of Rome of supporting her temporal power and spiritual supremacy to the utmost, and of strenuously opposing the reformers. The talent he displayed in the latter controversy called forth all the similar ability on the Protestant side; and for a number of years no eminent divine among the reformers failed to make his arguments a particular subject of refutation. His principal work is *Disputationes de Controversiis Christianæ Fidei adversus hujus Temporis Hæreticos.*

**BELLARY** (bel-ă'ri). A town in India, presidency of Madras, capital of a district of the same name, 280 miles north-west of Madras; a military station, with a fort crowning a lofty rock, and other fortifications. Pop. 862,372.

The district was ceded to the British in 1800. Area, 5904 sq. miles; pop. 862,372.

**BELLAY** (bel-ā), **Joachim du.** Distinguished French poet, born about 1524, died 1560. He joined Ronsard, Daurat, Jodelle, Belleau, Baif, and De Tisard in forming the "Pléiade," a society the object of which was to bring the French language on a level with the classical tongues. Bellay's first contribution was *La Deffence et Illustration de la Langue Françoyse.* His chief publications in verse are *Recueil de Poésies*; a collection of love-sonnets called *L'Olive*; *Les Antiquités de Rome*; *Les Regrets*; and *Les Jeux Rustiques.* In 1555 he became Canon of Notre-Dame, and a short time before his death he was made archbishop of Bordeaux. Spenser translated sixty of his sonnets into English (1591). In 1894 a statue of Bellay was unveiled at Ancenio. —Cf. Walter Pater, *Studies in the History of the Renaissance.*

**BELL-BIRD.** The name given to the *Arapunga alba*, a South American passerine bird, so named from its sonorous bell-like notes; and also to the *Myzantha melanophrys* of Australia, a bird of the family Meliphagidæ (honey-suckers), whose notes also resemble the sound of a bell.

**BELL-CRANK.** In machinery, a rectangular lever by which the direction of motion is changed through an angle of 90°, and by which its velocity-ratio and range may be altered at pleasure by making the arms of different lengths. It is much employed in machinery, and is named from its being the form of crank employed in changing the direction of the bell-wires of house-bells.

**BELLE-ALLIANCE.** A farm 13 miles S. of Brussels, famous as the position occupied by the centre of the French army in the battle of Waterloo, 18th June, 1815.

**BELLEEK'.** A village of Ireland, County Fermanagh, between Lough Erne and Ballyshannon, famous for a kind of iridescent porcelain known as Belleek ware. *See* POTTERY.

**BELLE-ISLE** (bel-ēl), **or BELLE-ISLE-EN-MER.** A French island in the Bay of Biscay, department of Morbihan, 8 miles S. of Quiberon Point; length, 12 miles; greatest breadth, 7 miles. Pop. 6670, largely engaged in the pilchard fishing. The capital is Le Palais on the N.E. coast.

**BELLE-ISLE** (bel-īl′). A rocky island, 9 miles long, at the eastern entrance to the Straits of Belle-Isle, the channel, 15 miles wide, between Newfoundland and the coast of Labrador. Large beds of iron-ore have been found there. Steamers from Glasgow and Liverpool to Quebec round the north of Ireland commonly go by this channel in summer as being the shortest route.

**BELLEISLE** (bel-ēl), **Charles Louis Auguste Fouquet, Comte de.** Marshal of France, born 1684, died 1761. He distinguished himself during the War of the Spanish Succession, afterwards in Spain and Germany, where, under Berwick, he took Trèves and Trarbach, and took part in the siege of Philippsburg. The cession of Lorraine to France was principally his work. He was created Marshal of France about 1740; commanded in Germany against the Imperialists; took Prague by assault; but the King of Prussia having made a separate peace, he was compelled to retreat, an operation which he performed with admirable skill. In 1744 he was taken prisoner by the English, but was soon exchanged. In 1748 he was made a duke and peer of France, and the department of war was committed to his charge.

**BEL′LENDEN, John.** *See* BALLENTYNE.

**BEL′LENDEN, William.** A Scottish writer, distinguished for the elegance of his Latin style, born between 1550 and 1560, probably at Lasswade, died between 1631 and 1633. He was professor of belles-lettres at Paris. His principal work is *De Statu Prisci Orbis* (1615), his other writings being chiefly compiled from Cicero, and forming the source of Middleton's *Life of Cicero*.

**BELLENGLISE.** A village of France, department of Aisne. It was captured from the Germans by British troops on 29th Sept., 1918.

**BELLER′IC.** *See* MYROBOLAN.

**BELLER′OPHON.** A large genus of fossil nautiloid shells, consisting of only one chamber, like the living Argonaut. They occur in the Silurian, Devonian, and Carboniferous strata.

**BELLEVILLE** (bel-vil′). A town of the United States, capital of St. Clair county, Illinois, with important manufactures and a large rolling-mill. Pop. 28,425.

**BELLEVILLE.** A town of Ontario, Canada, the county seat of Hastings county, on the Bay of Quinté, an inlet of Lake Ontario, and at the mouth of the Moira, with trade by lake and railway, and several manufactures. It is rather a fine town, and has two colleges and other educational institutions. Pop. 13,790.

**BELLEY** (bel-ā). A town, France, department Ain. It was a place of note in the time of Julius Cæsar, and is the seat of a bishopric, founded in 412. Pop. 6182.

**BELL-FLOWER.** A common name for the species of Campanula, from the shape of the flower, which resembles a bell.

**BELLINGSHAUSEN, Fabian Gottlieb Von.** Russian explorer. He was leader of an expedition that went to the Antarctic in 1819, when he discovered Alexander Land and Peter Land. He also commanded the Russian fleet in the Baltic and was Governor of Kronstadt. Bellingshausen Sea in the Antarctic is named after him. He died in 1852.

**BELLINI** (bel-ē′nē), **Jacopo,** and his two sons, Gentile and Giovanni, the founders of the Venetian school of painting. The father, born about 1400, excelled in portraits, but very little of his work is extant. He died in 1471. **Gentile** was born about 1427, and in 1479 went to Constantinople, Mohammed II. having sent to Venice for a skilful painter; died at Venice in 1507. **Giovanni** was born about 1428, and died about 1516. He contributed much to make oil-painting popular, and has left many noteworthy pictures. Titian and Giorgione were among his pupils.

**BELLINI** (bel-ē′nē), **Vincenzo.** A celebrated composer born at Catania in Sicily in 1802, died 1835. He was educated at Naples under Zingarelli, commenced writing operas before he was twenty, and composed for the principal musical establishments in Europe. His most celebrated works are: *I Montecchi e Capuleti* (1829); *La Sonnambula* (1831); *Norma*, his best and most popular opera; and *I Puritani* (1834).

**BELLINZO′NA.** A town of Switzerland, capital of the canton Ticino, charmingly situated on the left bank of the Ticino about 5 miles from its embouchure in the north end of Lago Maggiore. It occupies a position of great military importance. Pop. 10,676.

**BELLISLE.** *See* BELLE-ISLE.

**BELLITE.** *See* EXPLOSIVES.

**BELLMANN, Karl Mickel.** The most original among the Swedish lyric poets. Born in 1740, died 1795. His songs, in which love and liquor are common themes, are sung over the whole country, and "Bellmann" societies hold an annual festival in his honour.

**BELL-METAL.** *See* BELL.

**BELLOC, Hilaire.** Author. He was born in 1870, and educated at Balliol College, Oxford. He served for a while with the 8th Regiment of French Artillery. His writings range from children's books to books on strategy and tactics. They include *The Bad Child's Book of Beasts* (1896); *The Path to Rome* (1902); *Mr. Clutterbuck's Election* (1908); *A General Sketch of the European War, First and Second Phases* (1915-6); and *The Last Days of the French Monarchy* (1916); *Europe and the Faith* (1920); *The Jews* (1922); *History of England*, Vols. I. and II. (1925); *Many Cities* (1928); *How the Reformation Happened* (1928). In 1931 he published *A Conversation with a Cat.*

**BEL'LOWS.** An instrument or machine for producing a strong current of air, and principally used for blowing fires, either in private dwellings or in forges, furnaces, mines, etc. It is so formed as, by being dilated and contracted, to inhale air by an orifice which is opened and closed with a valve, and to propel it through a tube upon the fire. It is an ancient contrivance, being known in Egypt, India, and China many ages ago, while forms of it are used among savage tribes in Africa.

**BELLOWS-FISH.** An acanthopterygious fish of the genus Centriscus (*C. Scolopax*); called also the Trumpet-fish or Sea-snipe. It is not uncommon in the Mediterranean, but rare in the British seas. It is 4 or 5 inches long, and has an oblong oval body and a tubular elongated snout, which is adapted for drawing from among seaweed and mud the minute crustacea on which it feeds.

**BELLOY** (bel-wä), **Pierre Laurent Buirette de.** French dramatist, born 1727, died 1775. His principal plays are: *Zelmire*, a tragedy; *Le Siège de Calais*, which was immensely popular; *Gaston et Bayard*, which admitted him into the French Academy; and *Pierre le Cruel*. He was one of the first to introduce native heroes upon the stage.

**BELLOY-EN-SANTERRE.** A village of France, department of Somme. It was the scene of severe fighting in the European War.

**BELL ROCK,** or **INCH CAPE.** A dangerous reef surmounted by a lighthouse, situated in the North Sea about 12 miles from Arbroath, nearly opposite the mouth of the River Tay. It is said that in former ages the monks of Aberbrothock caused a bell to be fixed on this reef, which was rung by the waves, and warned the mariners of this highly-dangerous place. Tradition also says that the bell was wantonly cut away by a pirate, and that a year after he perished on the rock himself with ship and plunder. Southey has a well-known poem on this subject. The lighthouse was erected during 1808-11 by Robert Stevenson (grandfather of Robert Louis Stevenson) from Rennie's plan at a cost of upwards of £60,000. It rises to a height of about 120 feet; had originally a revolving light showing alternately red and white every minute, but has now a red and white flash-light, with tonite (explosive) fog-signals. Formerly it had bells for foggy weather. The reef is partly dry at ebb-tides.

**BELLUNO** (bel-lö'nō). A city of Northern Italy, capital of a province of the same name, on the Paive, 48 miles N. of Venice. Has a cathedral, a handsome theatre, etc.; and manufactures of silk, straw-plait, leather, etc. Pop. 25,423. Captured by the Austrians in Dec., 1917, the town was reoccupied by Italian troops on 2nd Nov., 1918.—The province has an area of 1293 sq. miles, and a pop. of 233,580.

**BELMONT.** A town of Cape Province, S. Africa. It is 58 miles from Kimberley. There is also a Belmont in Surrey.

**BELOE** (bē'lo), **William.** English clergyman and miscellaneous writer, born 1756, died 1817. He was educated at Cambridge, was presented to the rectory of Allhallows, London Wall, and subsequently to stalls in Lincoln Cathedral and St. Paul's. In 1803 he became keeper of the printed books in the British Museum, a post he did not retain. His chief publications are *Anecdotes of Literature and Scarce Books* (6 vols., 1806-12); a translation of Herodotus with a commentary; and *The Sexagenarian, or Memoirs of a Literary Life* (1817).

**BELOIT.** A city of the United States, in the south of Wisconsin, on Rock River, seat of a flourishing Presbyterian college. Pop. 23,611.

**BEL'OMANCY.** A kind of divination by arrows, practised by the ancient Scythians and other nations. One of the numerous modes was as follows: A number of arrows, being marked, were put into a bag or quiver, and drawn out at random; and the marks or words on the arrow drawn determined what was to happen.—Cf. Ezek. xxi., 21.

**BELOO'CHISTAN.** *See* BALUCHISTAN.

**BELPAS'SO.** A town of Sicily, on the southern slope of Mount Etna, and in the province of Catania, and 7½ miles

from the town of that name. Pop. about 10,730.

**BEL'PER.** A town, England, Derbyshire, in a valley, on the Derwent, 7½ miles N. of Derby, with large cotton-mills, foundries, etc., and in the neighbourhood numerous collieries. Since 1918 Belper gives its name to a parliamentary division of the county. Pop. (1931), 13,023.

**BELSHAZ'ZAR.** The last of the Babylonian kings, who reigned conjointly with his father Nabonadius. He perished 538 B.C., during the successful storming of Babylon by Cyrus. This event is recorded in the Book of Daniel; but it is difficult to bring the particulars there given into harmony with the cuneiform inscriptions.

**BELT,** or **BELTING.** A flexible endless band, or its material, used to transmit motion or power from one wheel, roller, or pulley to another, and common in various kinds of machinery. Driving-belts are usually made of leather, or india-rubber and some woven material, but ropes and chains are also used for the same purpose. *See* PULLEY.

**BELT, THE GREAT** and **LITTLE.** Two straits connecting the Baltic with the Kattegat, the former between the Islands of Zealand and Fünen, about 18 miles in average width; the latter between Fünen and the coast of Slesvig, at its narrowest part not more than a mile in width.

**BEL'TANE** (Gael. *beallt'winn*). The Celtic name for May-Day, on which also a festival was held, formerly observed in Ireland and Scotland, and still kept up in a fashion in some remote parts. It is celebrated in Scotland usually by kindling fires on the hills and eminences. In early time it was compulsory on all to have their domestic fires extinguished before the Beltane fires were lighted, and it was customary to rekindle the former from the embers of the latter. This custom no doubt derived its origin from the worship of the sun, or fire in general, which was formerly practised among the Celts as well as among various other heathen nations. The Beltane of the Irish is celebrated on the 21st of June. The earliest mention of the institution is contained in *Cormac's Glossary*, an Irish work of the tenth century, edited by O'Donovan and Stokes (1862).—BIBLIOGRAPHY: John Ramsay, *Scotland and Scotsmen in the 18th Century* (edited by A. Allardyce); A. Bertrand, *La Religion des Gaulois*; MacCulloch, *The Religion of the Ancient Celts*.

**BELU'CHISTAN.** *See* BALUCHISTAN.

**BELUGA** (be-lö'ga) (*Beluga arctica* or *Delphinapterus leucas*). A kind of whale or dolphin, the white whale or white fish, found in the northern seas of both hemispheres. It is from 12 to 18 feet in length, and is pursued for its oil (classed as "porpoise oil") and skin. In swimming the animal bends its tail under its body like a lobster, and thrusts itself along with the rapidity of an arrow. A variety of sturgeon (*Acipenser huso*) found in the Caspian and Black Sea is also called beluga.

**BE'LUS.** *See* BABYLONIA; BABEL.

**BELVEDERE** (bel've-dēr). In Italian architecture, the uppermost story of a building open to the air, at least on one side, and frequently on all, for the purpose of obtaining a view of the country and for enjoying cool air. A portion of the Vatican, in which several of the most important statues in the world are preserved, has this name.

**BELVOIR CASTLE.** The seat of the Duke of Rutland. It is situated in Leicestershire, about 7 miles from Grantham. The present castle dates from 1808, but there has been a castle here since about 1100.

**BELZO'NI, Giovanni Battista.** An enterprising traveller. Born at Padua in 1778, and died at Gato, Africa, 1823. In 1803 he emigrated to England, where, being endowed with an almost gigantic figure and commensurate strength, he for a time gained his living as an athlete. In 1815 he visited Egypt, where he made a hydraulic machine for Mehemet Ali. He then devoted himself to the exploration of the antiquities of the country, being supplied with funds by Salt, the British Consul-General. He succeeded in transporting the bust of Memnon (Rameses II.) from Thebes to Alexandria, from whence it came to the British Museum; explored the great temple of Rameses II. at Abu-Simbel; opened the tomb of Seti I., from which he obtained the splendid alabaster sarcophagus bought by Sir John Soane for £2000; and he also succeeded in opening the second (King Chephren's) of the pyramids of Gizeh. He afterwards visited the coasts of the Red Sea, the city of Berenice, Lake Mœris, the Lesser Oasis, etc. The narrative of his discoveries and excavations in Egypt and Nubia published in 1821) was received with general approbation. He died during a projected journey to Timbuctu. His original drawings, *The Tombs of the Kings*, were published by his widow, at London, in 1829.

**BEM, Joseph.** A Polish general, born at Tarnow, in Galicia, in 1795,

died at Aleppo 1850. His first service was in the French expedition against Russia in 1812. He served in the Polish army in the revolution of 1830, after which he proceeded to Paris, where for the next sixteen years he continued to reside, occupying himself partly with political schemes and partly with scientific pursuits. In 1848 he joined the Hungarian army, and in the following year obtained several successes against the Austrians and Russians; but after the defeat at Temesvar he retired into Turkey, where he embraced Mahommedanism and was made a pasha.

**BEMBECIDÆ** (bes'i-dē). A family of wasp-like hymenopterous insects with stings, mostly natives of warm countries, and known also as Sand-wasps. The female excavates cells in the sand, in which she deposits, together with her eggs, various larvæ or perfect insects stung into insensibility, as support for her progeny when hatched. They are very active, fond of the nectar of flowers, and delight in sunshine. Bembex is the typical genus of this family.

**BEMBO, Pietro.** Celebrated Italian scholar, born at Venice in 1470, died 1547. At Venice he became one of a famous society of scholars which had been established in the house of the printer Aldus Manutius. In 1512 he became secretary to Leo X., after whose death he retired to Padua. He was next appointed historiographer to the Republic of Venice, and librarian of the library of St. Mark. Pope Paul III. made him a cardinal in 1539, and soon after conferred on him the bishoprics of Gubbio and Bergamo. The most important of his works are: *History of Venice from 1487 to 1513*, written both in Latin and Italian; *Le Prose*, dialogues in which the rules of the Italian language are laid down; *Gli Asolani*, dialogues on the nature of love; and *Le Rime*, a collection of sonnets and canzonets.

**BEM'BRIDGE BEDS.** In geology, a fossiliferous division of the Oligocene strata, principally developed at Bembridge, in the Isle of Wight, consisting of marls and clays resting on a compact, pale-yellow or cream-coloured limestone, called Bembridge limestone. Their most interesting feature is the occurrence in them of mammalian remains, such as Palæotherium and Anoplotherium.

**BEMERSYDE.** An estate in Berwickshire which until recently was the residence of the Haig family. Earl Haig of Bermersyde took his title from here.

**BEN** (Heb., "son.") A prepositive syllable signifying in composition "son of," found in many Jewish names, as *Bendavid*, *Benasser*, etc. *Beni*, the plural, occurs in several modern names, and in the names of many Arabian tribes.

**BEN.** A Gaelic word signifying mountain, prefixed to the names of many mountains in Scotland north of the Firths of Clyde and Forth; as, *Ben* Nevis, *Ben* MacDhui, etc.

**BEN, OIL OF.** The expressed oil of the ben-nut, the seed of *Moringa pterygosperma*, the ben or horse-radish tree of India. The oil is inodorous, does not become rancid for many years, and is used by perfumers and watchmakers.

**BENARES** (be-nä'rez; in Skt., *Vārānasī*). A town in India, in the United Provinces of Agra and Oudh, administrative headquarters of a district and division of the same name, on the left bank of the Ganges, from which it rises like an amphitheatre, presenting a splendid panorama of temples, mosques, palaces, and other buildings with their domes, minarets, etc. Fine ghauts lead down to the river. It is one of the most sacred places of pilgrimage in all India, being the headquarters of the Hindu religion. To die at Benares is the greatest happiness for a Hindu, as he is then sure of admission into heaven. There is a constant influx of pilgrims into the city, and many of the Hindu princes and men of wealth have a town residence here.

**Buildings.** The principal temple is dedicated to Siva, whose sacred symbol it contains. The temple of the goddess Annpurna is known to Europeans as the cow-temple, and was built about 1721. Altogether there are over 1500 temples, a considerable number of these having been built after the establishment of the British power. The chief mosque is a splendid structure, built by Aurangzib on an elevated situation, forming with the observatory the most conspicuous buildings of the city. Benares is the seat of Government and other colleges, and of the missions of various societies. The colleges include the Queen's College and the Sanskrit College, the latter founded by Warren Hastings, and there are numerous schools, besides those belonging to the missionary societies. A Hindu university has recently been established at Benares. Among modern buildings in the European style are the town hall, the Prince of Wales' Hospital, and the Government College. Benares is an important railway junction, and a large steel railway bridge crosses the river. The town carries on a large trade in the produce of the district and in English goods, and has manufac-

tures of silks, shawls, embroidered cloth, jewellery, etc. The population is 205,315. The commissionership or division has an area of 10,431 sq. miles, and a pop. of 4,809,478, of whom 76·53 per cent depend on agriculture.—The state has an area of 875 sq. miles, and a pop. of 362,700. —Cf. E. B. Havrell, *Benares, the Sacred City.*

**BENBEC'ULA.** An island of Scotland, in the Outer Hebrides belonging to Inverness-shire, and lying between North and South Uist, separated from the former by a sound 3½ miles wide, from the latter by a channel only ½ mile broad and dry at low water. It is circular in shape, about 8 miles in diameter, low, flat, and barren, with innumerable small lochs and inlets of the sea. A good deal of land has been brought under cultivation, and the people are chiefly supported by agriculture, stock-rearing, and fishing. Pop. 1182.

**BEN'BOW, John.** An English admiral, born at Shrewsbury in 1653, died 1702. The son of a tanner, he is said to have run away to sea when apprentice to a butcher. In 1678 he became master's mate on board a man-of-war, and so distinguished himself that he was promoted to be master on board another, both vessels being actively engaged against the Barbary pirates. He appears to have again served on board merchant vessels from 1681-6, and he is said to have shown the utmost skill and gallantry in beating off a pirate-vessel when in command of a ship of his own in the Levant trade. He re-entered the navy in 1689, received rapid promotion, and was engaged in various affairs of importance. He took part in the unfortunate action off Beachy Head and in the glorious battle of La Hogue. He was for some time employed in protecting the English trade in the Channel, which he did with great effect, and in making attacks on St. Malo and other places on the French coast; and in 1695 he was promoted to the rank of rear-admiral.

In 1701 he sailed to the West Indies with a small fleet, and in August of the following year he fell in with the French fleet under Du Casse, and attempted to close with it and bring on a general action, but was not well supported by some of his captains. While in chase of the French a chain-shot carried away one of his legs. At this critical instant, being most disgracefully abandoned by several of the captains under his command, who urged him to give up the pursuit, the French fleet effected its escape. Benbow, on his return to Jamaica, brought the delinquents to a court martial, by which two of them were condemned to be shot; and they were shot, soon time after Benbow himself had die of his wounds, Nov., 1702.

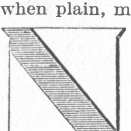
**BENCH.** The dais or elevated pa of a court-room where the judges sit Hence the persons who sit as judges The *King's* or *Queen's Bench*, i England, was originally a court i which the sovereign sat in person, an which accompanied his household The *bench of bishops*, or *Episcopa bench*, is a collective designation of the bishops who have seats in the House of Lords.

**BENCHERS.** In England, senior members of the Inns of Court who have the entire management of their respective inns, the power of punishing barristers guilty of misconduct, and the right to admit or reject candidates for the Bar.

**BENCH MARK.** A mark used by surveyors. It is a fixed point, serving as a datum line from which other measurements can be made or checked. Bench marks are used in tidal observations. The mark of the Ordnance Survey takes the form of a broad arrow.

**BENCOO'LEN** (Du., *Benkoelen*). A seaport of Sumatra, on the S.W. coast. The English settled here in 1685, and retained the place and its connected territory till 1825, when these were ceded to the Dutch in exchange for the settlements on the Malay Peninsula; since then Bencoolen has greatly declined. Pop. 10,000.

**BEND.** In heraldry, one of the nine honourable ordinaries, containing a third part of the field when charged and a fifth when plain, made by two



Bend

lines drawn diagonally across the shield from the dexter chief to the sinister base point. The *bend sinister* differs by crossing in the opposite direction, diagonally from the sinister chief to the dexter base.

**BENDER'.** A town and fortress in Bessarabia, on the Dniester. Its commerce is important, and it carries on some branches of manufacture. Taken by the Soviet forces from the Rumanians in April, 1919, it was recaptured later. Pop. 31,698.

**BENDER 'ABBAS.** A seaport of S. Persia, opposite the Island of Ormuz. Pop. 10,000.

**BEN'DIGO** (for a time called **SANDHURST**). A flourishing city of Victoria, Australia, about 100 miles N.N.W. of Melbourne, an important railway and gold-mining centre. It contains a handsome pile of public buildings, fine town hall, law-courts, banks, hospital, benevolent asylum, mechanics' institute (with a library of 15,000 volumes), a theatre, numerous places of worship, botanic gardens, etc. It is lighted with gas and electricity, and well supplied with water. Besides gold-mining, which employs 4000 to 5000 miners, iron-founding, making of railway rolling-stock, coach-building, stone-cutting, tanning, vine-growing, etc., are carried on. Pop. 33,690.

**BENEDIC'ITE** (Lat., "bless ye.") The canticle in the *Book of Common Prayer* in the morning service, also called the Song of the Three Holy Children: "O, all ye works of the Lord, *bless ye* the Lord." It comes from the Septuagint version of Daniel.

**BEN'EDICT.** The name of fifteen Popes, the first of the name succeeding to the papal chair on the death of John III. in 574. The first deserving of notice is Benedict IX., who succeeded John XIX. in 1033, being placed on the papal throne as a boy of twelve years. His licentiousness caused him to be ignominiously expelled by the citizens, who elected Sylvester III. Six months after he regained the ascendency, and excommunicated Sylvester; but finding the general detestation too strong to permit him to resume his chair, sold it to John Gratianus, who assumed the title of Gregory VI. There was thus a trio of Popes, and the emperor, Henry III., to put an end to the scandal, deposed all the three. He died in 1054.

**Benedict XIII.** A learned and well-disposed man, originally Cardinal Orsini and Archbishop of Benevento, became Pope in 1724. He bestowed his confidence on Cardinal Coscia, who was unworthy of it, and abused it in gratifying his avarice. He died in 1730, and was succeeded by Clement XII.—**Benedict XIV.,** Prospero Lambertini, born at Bologna in 1675, died 1758, a man of superior talents, passionately fond of learning, of historical researches, and monuments of art. Benedict XIII. made him, in 1727, Bishop of Ancona; in 1728 cardinal, and in 1732 Archbishop of Bologna. In every station he fulfilled his duties with the most conscientious zeal. He succeeded Clement XII. in 1740, and showed himself a liberal patron of literature and science. He was the author of several well-known religious works.—**Benedict XV.,** Giacomo della Chiesa, Pope, born at Pegli, near Genoa, on 21st Nov., 1854. Ordained to the priesthood in 1878, he was for a long time closely connected with Cardinal Rampolla. He was appointed Consultor of the Holy Office in 1901, Archbishop of Bologna in 1907, was made a cardinal in May, 1914, and elected Pope on 3rd Sept., 1914. Pope Benedict was an opponent of modernism in religion. He died 22nd Jan., 1922.

**BENEDICT, ST.** The founder of the first religious order in the West; born at Nursia, in the province of Umbria, Italy, A.D. 480, died 543. In early youth he renounced the world and passed some years in solitude, acquiring a great reputation for sanctity. Being chosen head of a monastery, his strictness proved too great for the monks, and he was forced to leave. The rule for monks, which he afterwards drew up, was first introduced into the monastery on Monte Cassino, in the neighbourhood of Naples, founded by him. His *Regula Monachorum*, in which he aimed, among other things, at repressing the irregular lives of the wandering monks, gradually became the rule of all the Western monks. Under his rule the monks, in addition to the work of God (as he called prayer and the reading of religious writings), were employed in manual labour, in the instruction of the young, and in copying manuscripts, thus preserving many literary remains of antiquity. *See* BENEDICTINES.

**BENEDICT, Sir Julius.** Pianist and composer, born at Stuttgart 1804, died at London 1885. He took up his residence in England in 1835, and was knighted in 1871. Principal works: the operas of *The Gypsy's Warning*, *Undine*, *St. Cecilia*, and *The Lily of Killarney*, based upon Dion Boucicault's play *The Colleen Bawn*, which in its turn was founded on Gerald Griffin's novel *The Collegians*.

**BENEDIC'TINE.** A liqueur prepared by the Benedictine monks of the abbey of Fécamp, in Normandy, consisting of spirit (fine brandy) containing an infusion of the juices of plants, and said to possess digestive, anti-spasmodic, and other virtues, and to have prophylactic efficacy in epidemics. It has been made in the same way since 1510.

**BENEDICTINES.** Members of the most famous and widely-spread of all the orders of monks, founded by Benedict of Nursia (480-543) at Monte Casino, about half-way between Rome

and Naples, in 528. No religious order has been so remarkable for extent, wealth, and men of note and learning as the Benedictines. Among the branches of the order the chief were the Cluniacs, founded in 910 at Clugny in Burgundy; the Cistercians, founded in 1098, and reformed by St. Bernard in 1116; and the Carthusians from the Chartreuse, founded by Bruno about 1080. The order was introduced into England about 600

Benedictine Monk

by St. Augustine of Canterbury, and a great many abbeys, and all the cathedral priories of England, save Carlisle, belonged to it. Their habit consists of a loose black gown with large wide sleeves, and a cowl on the head ending in a point. The Benedictines have produced many valuable literary works, and in the seventeenth century some of them were the most distinguished scholars of the Roman Catholic Church. The fraternity of St. Maur, founded in 1618, had in the beginning of the eighteenth century 180 abbeys and priories in France, and acquired fame by means of its learned members, such as Mabillon and Montfaucon. They published the celebrated chronological work, *L'Art de Verifier les Dates*, besides others. There are a small number of Benedictine houses in Britain, including an abbey and college at Fort-Augustus, Scotland.—BIBLIOGRAPHY: P. Hélyot, *Dictionnaire de Ordres Religieux*; F. A. Gasquet, *Sketch of the Life and Mission of St. Benedict*; E. L. Taunton, *The English Black Monks of St. Benedict* (2 vols.); Cardinal Newman, *The Mission of the Benedictine Order*; B. Destrée, *Les Bénedictins*.

**BENEDICTION.** *See* BLESSING.

**BENEDIC'TUS** (Lat., "blessed.") The song of Zacharias (Luke, i., 68-79) introduced into the *Book of Common Prayer* in the morning service.

**BEN'EFICE.** An ecclesiastical living; a church endowed with a revenue for the maintenance of divine service. Vicarages, rectories, perpetual curacies, and chaplaincies are termed benefices, in contradistinction to dignities, such as bishoprics, etc. The beneficiary system plays an important part in the organisation of the evangelical churches on the Continent and of the State church of England. In the United States benefices are almost unknown.

**BENEFICIARY.** Person who receives the benefit or income from a property, although not the legal owner.

**BENEFIT SOCIETIES.** *See* BUILDING SOCIETIES and FRIENDLY SOCIETIES.

**BENES, Eduard.** Czech statesman, born in 1884, he became a lecturer on sociology and economics at Prague University. Later he went to Paris where he helped to organise the Czecho-Slovaks into a nation. When Czecho-Slovakia came into existence he was chosen as Foreign Minister and later as Premier. He was still Foreign Minister in 1932. *My War Memories* (English translation) appeared in 1928.

**BENEVEN'TO.** A city of Southern Italy, the see of an archbishop, in a province of same name, on a hill between the Rivers Sabato and Calore, occupying the site of the ancient Beneventum, and largely built of its ruins. Few cities have so many remains of antiquity, the most perfect being a magnificent triumphal arch of Trajan, built in 114. The cathedral is a building of the twelfth century in the Lombard-Saracenic style. Pop. 36,962.—The province has an area of 834 sq. miles, and a pop. of 266,980.

**BENEV'OLENCES.** A means of raising money by forced loans or contributions, first adopted by Edward IV., and employed frequently down to the time of James I.

**BENFIELDSIDE.** An urban district or town of England, Durham, 13 miles south-west of Gateshead, on the Derwent, not far from Consett. Pop. (1931), 9193.

**BENGAL** (ben-gal'). A name formerly given to one of the three "pre-

sidencies" of British India which included the whole of British India except what was under the governors of Madras and Bombay. Afterwards in this sense the term had no administrative meaning except as regards the army. By Bengal is now usually understood the Presidency of Bengal, the most important of the local governments of British India. It comprises the deltas and lower valleys of the Ganges. It extended north to Nepal and Sikkim, west to the United and Central Provinces, south to the Bay of Bengal, east to Eastern Bengal, its great divisions being the Presidency (Calcutta, etc.), Bhagalpur, Patna, Burdwán, Chota Nagpur, and Orissa. In 1905 the divisions Dacca, Chittagong, and Rajshahi were disjoined, and with Assam became the lieutenant-governorship of Eastern Bengal and Assam. In 1912 the Presidency was reorganised, and a new province—that of Bihar and Orissa—formed, Assam being made a separate province under a chief Commissioner. The area of Bengal is now about 76,843 sq. miles, the population 46,695,536, or with the native states of Cooch Behar and Hill Tippera, the area is 82,277 sq. miles, and the pop. 50,122,550.

**Physical Features.** As a whole Bengal consists of plains, there being few remarkable elevations, though it is surrounded with lofty mountains. It is intersected in all directions by rivers, mostly tributaries of its two great rivers the Ganges and Brahmaputra, which annually, in June and July, inundate a large part of the region. These annual inundations render the soil extremely fertile, but in those tracts where this advantage is not enjoyed the soil is thin, seldom exceeding a few inches in depth. The *Sundarbans* or Sunderbunds (from being covered with the sunder tree), that portion of the country through which the numerous branches of the Ganges seek the sea, about 150 miles from E. to W. and about 160 miles from N. to S., is traversed in all directions by watercourses, and interspersed with numerous sheets of stagnant water. The country is subject to great extremes of heat, which, added to the humidity of its surface, renders it generally unhealthy to Europeans. The seasons are distinguished by the terms hot (March to June), rainy (June to October), and cold (the remainder of the year). The most unhealthy period is the latter part of the rainy season. The heaviest rainfall occurs in Darjeeling, the annual average amounting to over 100 inches; elsewhere it is generally not over 50 inches. Besides rice and other grains, which form along with fruits the principal food of the population, there may be noted among the agricultural products indigo, opium, cane-sugar, tobacco, betel, cotton, and jute. Tea is extensively grown in some places, more especially in the Darjeeling district. Cinchona is cultivated in Darjeeling and elsewhere. The forests cover an area of about 12,000 sq. miles, the principal forest trees being the sál on the Himalaya slopes, sál and teak in Orissa. Wild animals are most numerous in the Sundarbans and Orissa, snakes being remarkably abundant in the latter district. The principal minerals are coal, iron, and salt. Coal is worked at Raniganj, in Burdwán district, where the seams are about 8 feet in thickness, and iron in the district of Birbhúm, in the same division. Salt is obtained from the maritime districts of Orissa.

**Manufactures.** The principal manufactures are cotton piece-goods of various descriptions, jute fabrics, blanketing, and silks. Muslins of the most beautiful and delicate texture were formerly made at Dacca, but the manufacture is almost extinct. The breeding of silk-worms is carried on more largely in Bengal than in any other part of India, and silk-weaving is a leading industry in many of the districts. The commerce, both internal and external, is very large. The great bulk of the trade passes through Calcutta. The chief exports are opium, jute, indigo, oil-seeds, tea, hides and skins, and rice; the chief import is cotton piece-goods. Internal communication is rendered easy by a very complete railway and canal system, while the boat trade on the river is, for magnitude and variety, quite unique in India.

The people are mainly of Hindu race, but there is a certain proportion of Santals and others of different race. Nearly 24,000,000 are Mahommedans in religion, and about 20,380,000 profess Hinduism. The dialects spoken are Bengali in Bengal proper, Hindi in Patna division, and Uriya in Orissa. The first rudiments of education are usually given in the primary schools that have been developed out of the native schools, and are now connected with Government. There are also a number of secondary and superior schools established by Government, including eight Government colleges. The highest educational institution is the Calcutta University, the chief function of which is to examine and confer degrees. The population of Bengal, beyond the capital, Calcutta, and its suburbs, is largely rural.

**History.** The first of the East India Company's settlements in Bengal were made early in the seventeenth century. The rise of Calcutta dates

from the end of the same century. The greater part of Bengal came into the hands of the East India Company in consequence of Clive's victory at Plassy in 1757, and was formally ceded to the Company by the Nabob of Bengal in 1765. Chittagong had previously been ceded by the same prince, but its government under British administration was not organised till 1824. Orissa came into British hands in 1803. In 1858 the country passed to the Crown, and since then the history of Bengal has been, on the whole, one of steady and peaceful progress. —BIBLIOGRAPHY: Ramesachandra Datta, *Brief History of Ancient and Modern Bengal*; C. Stewart, *The History of Bengal*; L. S. S. O'Malley, *Bengal, Bihar* and *Orissa, Sikkim*; S. Reed (editor), *The Indian Year-book* (annual).

**BENGAL, BAY OF.** That portion of the Indian Ocean which lies between Indian and Farther India, or Burma, Siam, and Malacca, and may be regarded as extending south to Ceylon and Sumatra. It receives the Ganges, Brahmaputra, and Irrawaddy. Calcutta, Rangoon, and Madras are the most important towns on or near its coasts.

**BENGAL HEMP.** *See* SUNN.

**BENGA'LI.** One of the vernacular languages of India, spoken by about 42,000,000 people in Bengal, akin to Sanskrit and written in characters that are evidently modified from the Devanâgari (Sanskrit). Its use as a literary language began in the fourteenth century with poetry. Large numbers of Bengali books are now published, as also newspapers. A large number of words are borrowed from Sanskrit literature.

**BENGAL LIGHT.** A kind of firework often used for signalling by night at sea, producing a steady vivid blue-coloured flame.

**BENGEL** (beng'l), **Johann Albrecht.** A German theologian, born in 1687, died in 1752. He rendered good service by his criticism of the text of the New Testament, and his *Gnomon Novi Testamenti* has passed through many editions, and is still of value.

**BEN-GHAZI** (ancient **Hesperides**, later *Berenice*, modern Berber). A town of Libya, North Africa, capital of the Italian colony Cyrenaica. Pop. 33,700.

**BENGUELLA** (ben-gā'lā). A town of Portuguese West Africa, capital of Benguella district. Situated on the coast, on a bay of the Atlantic, in a charming but very unhealthy valley. It was founded in 1617, was formerly an important centre of the slave-trade, and has now an export trade in rubber, hides, ivory, wax, gum, etc. It is the terminus of a railway that crosses the Continent to Beira, passing through the Belgian Congo, and Rhodesia, and controlled by the Portuguese, Belgian, and British authorities. The final link was opened in 1932. Pop. 6000.—For Benguella district *see* ANGOLA.

**BENHA.** A town of Egypt, on the Damietta branch of the Nile, an important railway junction. Pop. 28,626.

**BENI** (bā'nē). A river, South America, State of Bolivia. It rises in the eastern slopes of the Andes, and after a course of 900 miles joins the Mamoré to form the Madeira, which flows into the Amazon near Serpa.

**BENICARLO'.** A Spanish town on the Mediterranean, province of Castellon; the place of export of well-known red wines sent to Bordeaux to be mixed with clarets, or to England to be manufactured into port. Pop. 8000.

**BENI-HASSAN.** A village of Middle Egypt, on the east bank of the Nile, remarkable for the grottoes or catacombs in the neighbourhood, supposed to have formed a necropolis for the chief families of the city, Hermopolis, on the opposite bank, and exhibiting interesting paintings, etc.

**BENI-ISRAEL.** Native Jews of India, dwelling mainly in the Presidency of Bombay and known formerly by the name of "Shanvar Telis" (Saturday Oil-Pressers). Their religion is a modified Judaism, and they are supposed to be a remnant of the ten tribes. Their numbers amount to some 10,000.

**BENI-MZÂB.** A race or tribe of Berbers that dwell in the Sahara near its northern border and recognise the supremacy of the French. They number about 60,000 of whom 15,000 are in the town Ghardaya. They are of peaceful habits, and numbers of them are employed in Algiers in various occupations.

**BENIN'.** A negro country of West Africa, on the Bight of Benin, extending along the coast on both sides of the Benin River, west of the lower Niger, and to some distance inland. The chief town is Benin, situated about 50 miles from the coast, and consisting of clay-built houses. Benin is now British and belongs to Southern Nigeria. The country is well wooded and watered, and rich in vegetable productions. Cotton is indigenous, and woven into cloth by the women, and sugar-cane, rice, yams, etc., are grown. The religion is Fetishism, and

human sacrifice used to be common. There is a considerable trade in palm-oil, etc., and a road now runs from the Forcados estuary to Benin.

**BENIN, BIGHT OF.** Part of the Gulf of Guinea, W. Africa, which extends into the land between the mouth of the River Volta and that of the Nun.

**BENI-SAF'.** A seaport of Algeria, department Oran, exporting large quantities of iron-ore. Pop. 11,819.

**BENI-SUEF'.** The capital of a province of the same name in Middle Egypt, situated on the left bank of the Nile, 63 miles from Cairo, and having the chief trade of the Faiyum Valley. It has cotton-mills and alabaster quarries, and an important annual market; pop. 39,595. The province has an area of 423 sq. miles, and a pop. in 1927 of 506,830.

**BENIT'IER,** or **BENATU'RA.** A stone font or vase for containing holy water, usually placed in a niche in the chief porch or entrance of a Roman Catholic church, sometimes in one of the pillars close to the door, into which the members of the congregation on entering dip the fingers of the right hand, and then cross themselves.

**BENITOITE.** A rare mineral first described by Louderback in 1907, occurring in schists in California. It is colourless to blue, and its hardness allows of its use as a gem. It is a barium titanium silicate, and is the only known representative of the highest class of symmetry in the trigonal system of crystal forms.

**BENJAMIN.** *Same as* BENZOIN (q.v.).

**BENJAMIN OF TUDELA.** A Jewish rabbi, born in Navarre in the twelfth century, chiefly known by his *Itinerary*, a record of his journey through Italy, Greece, Palestine, Persia, and other parts of Asia, as well as Egypt and Sicily. He died in 1173, and his notes, under the title of *Massaot*, were first published in Hebrew at Constantinople in 1543. English translation by M. N. Adler in 1907.

**BENKULEN.** A seaport of S. W. Sumatra.

**BEN LO'MOND.** A mountain of Scotland, in Stirlingshire, on the east shore of Loch Lomond, rising to a height of 3192 feet and giving a magnificent prospect of the vale of Stirlingshire, the Lothians, the Clyde, Ayrshire, Isle of Man, hills of Antrim, etc.

**BEN MAC-DHUI,** or **BEN MUICH-DHUI** (-mik-dö'i). The second highest mountain in Scotland, situated in the south-west of Aberdeenshire, on the borders of Banffshire, forming one of a cluster of lofty mountains, among which are Brae-riach, Cairntoul, and Cairngorm. Height, 4296 feet.

**BENNE** (ben'e) **OIL.** A valuable oil expressed from the seeds of *Sesamum indicum*, much cultivated in India, Egypt, etc., and used for the same purposes as olive-oil. Also called *sesamum oil* and *gingelly oil*.

**BENNET.** *See* AVENS.

**BENNETT, Arnold.** English novelist and dramatist. He was born at Shelton, near Hanley, 27th May, 1867, and became a law student there. Later he moved to London and became a journalist, working as such from 1893 to 1900, part of the

Arnold Bennett

time as editor of *Woman*. In 1898 he published his first novel, *A Man from the North*, and in 1902 he made a name with *Anna of the Five Towns*. He followed this up with *A Great Man*, *The Old Wives' Tale*; and the trilogy: *Hilda Lessways*, *Clayhanger*, and *These Twain*. Other successes were *Helen of the High Hand*, *The Card*, *The Regent* and a volume of short stories called *The Matador of the Five Towns*. These books deal with life in the five towns of the Potteries, thinly disguised by the author, and stand as his best work. They portray the conditions there with a vivid fidelity that stamps him as a master of his art. London is mainly the scene of his later works, which, although books of considerable power, lack the vitality of the earlier ones. They include *The Pretty Lady*, *Elsie and the Child*, *Riceyman*

*Steps*, *Lord Raingo* and *The Grand Babylon Hotel*.

Bennett was also a keen student of the theatre. He wrote *The Great Adventure*, an adaptation of his novel *Buried Alive*, and other plays, and with E. Knoblock was responsible for *Milestones* and *Mr. Prohack*. He wrote a good deal of dramatic criticism and in his later years articles on a variety of subjects for the press. He died 27th March, 1931. Two stories, *Dream of Destiny* and *Venus Rising from the Sea*, were published posthumously in 1932.

**BEN'NETT, James Gordon** (senr.). An American journalist, born in Banffshire, Scotland, 1795, and educated at Aberdeen. He emigrated to Halifax, Nova Scotia, in 1819 as a teacher, and went thence to Boston as a proof-reader. In 1822 he went to New York, and, after being connected with various papers, started the *New York Herald* in 1835. By his enterprise and not very scrupulous conduct of the journal it speedily became an enormous success, its yearly profit at his death being estimated at from a half to three quarters of a million dollars. It was the first paper which published a daily money article and stock lists. The expedition of Stanley to Africa, in 1871, in search of Livingstone was projected and supported by Bennett, who, however, died in the following year.

**BENNETT, James Gordon** (junr.). Son of the preceding, American journalist, born at New York 10th May, 1841, died at Beaulieu-sur-Mer, France, 14th May, 1918. When his father died in 1872 he assumed control of the *New York Herald*, in the management of which he had already taken an active part since 1866. He was a man of much originality. One of his greatest ventures was to commission Stanley to find Livingstone, whom everyone believed to be dead. In conjunction with the London *Daily Telegraph*, he financed Stanley's Congo Expedition in 1874, and in 1879 fitted out the *Jeannette* Polar Expedition. With John W. Mackay he established the Commercial Cable Company in 1883. He was an ardent supporter of the idea of the Channel Tunnel, but opposed the scheme of the Panama Canal. A great friend of France, and a supporter of the Anglo-French Alliance, he lived chiefly in Paris, or on board his yacht. He married in Sept., 1914, and died four years later.

**BENNETT, Richard Bedford.** Canadian politician, born 3rd July, 1879, in New Brunswick, he practised as a lawyer there. In 1897 he moved to Calgary and soon became a member of the legislature of Alberta. In 1911 he entered the Dominion House of Commons as a Conservative. In 1917 he was Director of National Service and in 1921 Minister of Justice in the Coalition Government. In 1926 he was for a short time Minister of Finance, and in 1927 he was chosen leader of the Conservative party. In July, 1930, he became Prime Minister, and as such he attended the Imperial Conference in London in Oct. 1930.

**BENNETT, Sir William Sterndale.** English composer, born in 1816 at Sheffield, where his father was organist; became pupil of the Royal Academy in 1826, studying under Cipriani Potter, Crotch, and Lucas, and afterwards Moscheles. By the advice of Mendelssohn, whose friendship he had gained, he studied in Leipzig from 1836 to 1838, and his performances and compositions were held in high esteem by the younger German musicians, and especially by Schumann. After a period spent in teaching, conducting, and composing, he was appointed professor of music at Cambridge in 1856, and he was knighted in 1871. He was too entirely dominated by Mendelssohn's influence to do great original work. He is best known by his overtures, the *Naiads* and *Parisina*; his cantatas, *The May Queen* and *Woman of Samaria*; and his little musical sketches, *Lake*, *Millstream*, and *Fountain*. He died in 1875.

**BEN NE'VIS.** The most lofty mountain in Great Britain, in Inverness-shire, immediately east of Fort-William and the opening of the Caledonian Canal, at the south-western extremity of Glenmore. It rises to the height of 4406 feet, and in clear weather yields a most extensive prospect. An observatory was established on its summit in May, 1881, by the Scottish Meteorological Society, but was closed in 1904.

**BENONI.** A town in the Transvaal, South Africa, 20 miles east of Johannesburg. It is an important gold-mining centre. Pop. (1921), 47,641 (14,483 white).

**BENSHI'.** *See* BANSHEE.

**BENSON, Arthur Christopher,** LL.D., C.V.O. Born in 1862, son of the late Archbishop of Canterbury. He was a master at Eton from 1885 to 1903. Since 1915 he has been master of Magdalene College, Cambridge. He has written many volumes of essays, including *The Thread of Gold*, *From a College Window*, and *Beside Still Waters*, as well as editing the letters of Queen Victoria. He died in 1925.

**BENSON, Edward Frederic.** Born

in 1867, son of the late Archbishop of Canterbury. He has written many clever novels of which the earliest was *Dodo* (1893); others among them are *The Angel of Pain* (1906), *Sheaves* (1907), *The Osbornes* (1910), *David Blaize* (1916), and *Across the Stream* (1919). He has also written the autobiographical *Our Family Affairs*, and in 1932 appeared a book on Charlotte Brontë.

**BENSON, Edward White.** Archbishop of Canterbury, was born at Birmingham on 14th July, 1829, the son of a manufacturing chemist, and was educated there and at Trinity College, Cambridge, where he graduated with distinction in 1852, and was elected a Fellow. He was a master at Rugby, and became the first headmaster of Wellington College in 1859. In 1876 he was appointed Bishop of Truro, and in 1883 he was enthroned Archbishop of Canterbury. "No Archbishop of Canterbury since the Reformation," it has been declared, "exercised such an influence outside the British Isles as he did," while he was ever active in matters that concerned the Church at home and the nation at large. He laboured successfully on behalf of the reform of Church patronage and discipline, and in defence of all Church interests, being a zealous opponent of Welsh disestablishment. While visiting W. E. Gladstone, he died suddenly at morning service in Hawarden Church, 11th Oct., 1896. Many writings came from the archbishop's pen, the most important being a work on *Cyprian: His Life, Times, and Work* (1897), and another entitled *The Apocalypse: an Introductory Study* (1900). A biography was published by his eldest son, Dr. A. C. Benson (q.v.).

**BENSON, Sir Frank R.** Actor-manager, was born in 1858. He was educated at Winchester and New College, Oxford, where he was a distinguished athlete. He founded the well-known répertoire company which bears his name. He has been responsible for twenty-six of the annual Shakespeare Festivals at Stratford-on-Avon. He was knighted in 1916, and in 1930 issued his *Memoirs*.

**BENSON, Robert Hugh.** Born 1871, died 1914, son of the late Archbishop of Canterbury. He became a member of the Roman Catholic Church in 1903. He wrote several novels and books of short stories, *The Light Invisible*, *The Sentimentalists*, and *The Necromancers* being among them. He also wrote *The Religion of the Plain Man* and *Confessions of a Convert*.

**BENTHAM** (ben'tham), **George.** English botanist, nephew of Jeremy Bentham, born 1800, died 1884. He was privately educated, early attached himself to botany, and, having resided in Southern France (where his father had an estate) from 1814-26, he published in French (1826) a work on *The Plants of the Pyrenees and Lower Languedoc*. Having returned to England he studied law, and on this subject, as well as logic, he developed original views. Finally, however, he devoted himself almost entirely to botany, was long connected with the Horticultural Society and the Linnæan Society, and from 1861 onwards was in almost daily attendance at Kew, working at descriptive botany from ten to four o'clock as a labour of love. Along with Sir J. D. Hooker he produced the great work of descriptive botany, *Genera Plantarum*; another great work of his was the *Flora Australiensis* (in 7 vols.). His *Handbook of the British Flora* is well known.

**BENTHAM** (ben'tham), **Jeremy.** English jurist and moral philosopher, born at London in 1748; educated at Westminster and Oxford; entered Lincoln's Inn, 1763. He was called to the Bar, but did not practise, and, having private means, devoted himself to the reform of civil and criminal legislation. A criticism on a passage in *Blackstone's Commentaries*, published under the title *A Fragment on Government* (1776), brought him into notice; and it was followed by many works, of which the more important were: *The Hard Labour Bill* (1778), *Principles of Morals and Legislation* (1780), *A Defence of Usury* (1787), *Introduction to the Principles of Morals and Legislation* (1789), *Discourses on Civil and Penal Legislation* (1802), *Treatise on Judicial Evidence* (1813), *Paper Relative to Codification and Public Instruction* (1817), and the *Book of Fallacies* (1824). *Deontology, or the Science of Morality* was published after the author's death by his disciple Sir J. Bowring, who also edited Bentham's collected works in 11 vols. (1838-43). His mind, though at once subtle and comprehensive, was characterised by something of the Coleridgean defect in respect of method and sense of proportion; and he is therefore seen at his best in works that underwent revision at the hands of his disciples. Of these M. Dumont, by his excellent French translations and rearrangements, secured for Bentham at an early date a European reputation and influence.

In England James Mill, Romilly, John Stuart Mill, Burton, and others of independent genius have been among his exponents. Bentham's aim

in life was the reform of legislation. In ethics he must be regarded as the founder of modern utilitarianism; in polity and criminal law he anticipated or suggested many practical reforms; and his whole influence was stimulating and humanising. His standard of ethical judgment he expressed in the famous phrase: "The greatest happiness of the greatest number." He died in London, 6th June, 1832, leaving his body for dissection. His remains are to be seen at University College, London. *See* UTILITARIANISM.—BIBLIOGRAPHY: *Dictionary of National Biography* (article *Bentham*); C. M. Atkinson, *Jeremy Bentham: His Life and Work*; Sir Leslie Stephen, *The English Utilitarians*.

**BENTINCK', Lord William Charles Cavendish.** Second son of the third Duke of Portland, born in 1774. He served in Flanders, in Italy under Suwarov, and in Egypt; was Governor of Madras 1803-5; and commanded a brigade at Corunna. In 1810 he was British plenipotentiary and commander-in-chief of the troops in Sicily; and in 1813 headed an expedition into Catalonia. In 1814 he endeavoured to stimulate a revolt against the French in Italy and took possession of Genoa. The same year he returned to England and entered Parliament. In 1827 he was sent to India as Governor-General. Many wholesome measures marked his administration, which lasted till 1835, when he returned and became member of Parliament for Glasgow. He died in 1839.

**BENTINCK', Lord William George Frederick Cavendish.** Son of the fourth Duke of Portland, born in 1802. He entered the army, but quitted it to become private secretary to Canning, and in 1827 entered Parliament. Up to 1846 he was a warm adherent of Sir Robert Peel, but in that year came forward as leader of the Protectionists in the House of Commons, abandoning the turf, where he had long reigned supreme. With the assistance of Disraeli he maintained this position for two years, and though often illogical, and sometimes unscrupulous in his statements, he nevertheless commanded much attention by the vigour and earnestness of his oratory and deportment. He died in 1848.

**BENT'LEY, Richard.** Great English classical scholar and critic, born near Wakefield, Yorkshire, in 1662. At the age of fourteen he entered St. John's College, Cambridge, where he took the degree of B.A. in 1680. In 1682 he became a master of Spalding School, and in the following year was appointed tutor to Dr. Stillingfleet's son. He lived in Dr. Stillingfleet's house from 1683 to 1689, studying deeply, and accompanied his pupil to Oxford. In 1684 he took his M.A. degree at Cambridge, and in 1689 at Oxford, where two years later he won immediate reputation by the publication of his epistle to Mill on the Greek *Chronicle* of Malalas. Dr. Stillingfleet, having been raised to the bishopric of Worcester, made Bentley his chaplain, and in 1692 a prebendary in his cathedral. The same year he delivered the first series of the Boyle Lectures, his subject being *A Confutation of Atheism*. In 1694 he was appointed keeper of the royal library at St. James's Palace, and in 1696 came into residence there.

Two or three years after began his famous controversy with the Hon. Charles Boyle, afterwards Earl of Orrery, about the genuineness of the Greek *Epistles of Phalaris*, an edition of which was published by Boyle, who was then at Christ Church, Oxford. In this dispute Bentley was completely victorious, though the greatest wits and critics of the age, including Pope, Swift, Garth, Atterbury, Aldrich, Dodwell, and Conyers Middleton, came to Boyle's assistance. Bentley's *Dissertation on the Epistles of Phalaris* appeared in 1699—"a monument of controversial genius"—"a storehouse of exact and penetrating erudition." In 1700 he was presented to the mastership of Trinity College, Cambridge, and from this period until 1738 he was at feud with the Fellows of that college. A lawsuit, which lasted more than twenty years, was decided against him, but his opponents were unable to carry out the sentence depriving him of his mastership. In 1711 he published an edition of Horace, and in 1713 his *Remarks on a late Discourse of Freethinking*, by Phileleutherus Lipsiensis, a reply to Anthony Collins, the deist. He was appointed regius professor of divinity in 1716. In 1726 he published an edition of Terence, and of Phædrus. He meditated an edition of Homer, but left only notes. In Homeric criticism he has the merit of having detected the loss of the letter "digamma" (q.v.) from the written texts. His last work was an edition of Milton's *Paradise Lost*, with conjectural emendations (1732). He died in 1742, and was interred in the college chapel. Bentley was one of the great classical scholars of Europe, and his influence is not even yet exhausted. —BIBLIOGRAPHY: J. H. Monk, *Life of Richard Bentley*; Sir R. C. Jebb, *Bentley* (in English Men of Letters Series); A. T. Bartholomew, *Richard Bentley: a Bibliography of His Works*.

**BENUÉ,** or **BINUÉ** (ben′ụ-ā, bin′ụ-ā; "Mother of Waters"). A river of Africa, the greatest tributary of the Niger, which it enters from the east about 250 miles above its mouth. Dr. Barth came upon the river in 1851, and its course was partly traced by Dr. W. Balfour Baikie, but its source was only reached (by Flegel) in 1883. It is an important waterway for Northern Nigeria during a great part of the year.

**BENWELL AND FENHAM.** An urban district of England, forming a western suburb of Newcastle-on-Tyne.

**BENZALDEHYDE,** or **BITTER-ALMOND OIL** ($C_6H_5CHO$). A colourless, oily liquid with a strong, rather pleasant odour. It occurs as a glucoside in oil of bitter almonds, from which source it can be obtained by heating for some time with dilute alkali or acid. If left exposed to air, it gradually solidifies and is transformed into *benzoic acid*. The substance is important, as it is used in the preparation of many dyes and also in perfumery.

**BEN′ZENE,** or **BENZOL** ($C_6H_6$). A liquid hydrocarbon is obtained by fractional distillation of coal-tar. It may be obtained pure by distilling one part benzoic acid with three parts lime. Benzene is a colourless, highly-refractive, volatile liquid boiling at 80·4° C., and melting at 5·4° C. It burns with a very smoky flame, and has a characteristic rather agreeable odour. Commercial benzene, 90 per cent benzol, contains thiophene, carbon disulphide, and other impurities, which can be removed by various methods. Benzene is an exceedingly important hydrocarbon; it constitutes a valuable solvent for a number of organic substances, e.g. rubber, lacs for linoleum manufacture, fats, oils, and varnishes. It is also used in the preparation of compounds such as nitrobenzene, aniline, artificial indigo, dyes, and as a motor fuel.

**BENZER′TA.** *See* BIZERTA.

**BENZIDINE,** or ***p*-AMINODIPHENYL** ($NH_2C_6H_4—C_6H_4NH_2$). A white solid prepared from nitro-benzene by treating it with sodium hydroxide and zinc dust, distilling off any aniline formed, and warming the residue with hydrochloric acid. Benzidine is classed as a *basic substance*, that is, it forms salts readily with mineral acids, and it resembles aniline in many respects. Large quantities of the substance are manufactured for the preparation of *benzidine dyes*, which form the most important class of dyes in use.

**BENZO′IC ACID.** An acid found in gum-benzoin and other resins, from which it is extracted by heating either alone or with calcium hydroxide. It is prepared in quantity from toluene, a hydrocarbon occurring along with benzene in coal-tar and other tars. Benzoic acid is a white crystalline solid melting at 121° C. It is soluble in water, and its vapour has an irritating odour. The acid is used in medicine, in the textile industry, as a preservative for various foods, and in the treatment of tobacco.

**BENZOIC ETHER,** or **ETHYL BENZOATE.** A colourless, oily liquid, with a pleasant aromatic smell, is obtained by distilling together four parts alcohol, containing about 3 per cent of hydrochloric acid gas, and two of benzoic acid. It belongs to the class of organic compounds, the *esters*, a series of compounds formed by the union of an organic acid with an alcohol.

**BEN′ZOIN,** or **GUM BENZOIN** (Ar. *luban jāwi*, "Javanese incense"). A solid, brittle, vegetable substance, the concrete resinous juice flowing from incisions in the stem or branches

Benzoin. Branch of *Styrax Benzoin*

of the *Styrax Benzoin*, a tree 70 or 80 feet high, nat. ord. Styracaceæ. In commerce several varieties are distinguished, of which the yellow, the Siam, the amygdaloidal—the last containing whitish tears of an almond shape—and Sumatra firsts are the finest. It is imported from Siam, Singapore, Bombay, and occasionally from Calcutta. The pure benzoin consists of two principal substances,

viz. a resin and an acid termed *benzoic* (q.v.). It has little taste, but its smell is fragrant when rubbed or heated, and it is used as incense in the Greek and Roman Catholic Churches. It is insoluble in water, but soluble in alcohol, in which form it is used as a cosmetic and in pharmacy.

**BENZOL** (-zōl'). *See* BENZENE.

**BEN'ZOLINE.** A name of liquids similar to benzene, and obtained from petroleum.

**BENZOPHENONE, or DIPHENYL KETONE** ($C_6H_5CO—C_6H_5$). A colourless crystalline solid of low melting-point, m.p. 42° C. It can be prepared from calcium benzoate by distilling it, or from benzene by treating with benzoyl chloride. Benzophenone belongs to the class of compounds known in organic chemistry as the *ketones*.

**BENZYL ALCOHOL** ($C_6H_5CH_2OH$). A colourless, pleasant-smelling liquid prepared either from *toluene* or from *benzaldehyde*. It is almost insoluble in water, and is used industrially in the preparation of various perfumes.

**BE'OWULF.** An Anglo-Saxon epic, the only existing MS. of which belongs to the eighth or ninth century, and is in the Cottonian Collection (British Museum). From internal evidence it is concluded that the poem in its essentials existed prior to the Anglo-Saxon colonisation of Britain, and that it must be regarded either as brought to Britain by the Teutonic invaders or as an early Anglo-Saxon translation of a Danish legend. From the allusions in it to Christianity, however, it must have received considerable modifications from its original form. It recounts the adventures of the hero Beowulf, especially his delivery of the Danish kingdom from the monster Grendel and his equally formidable mother, and, lastly, the slaughter by Beowulf of a fiery dragon, and his death from wounds received in the conflict. The character of the hero is attractive through its noble simplicity and disregard of self. The poem, which is the longest and most important in Anglo-Saxon literature, is in many points obscure, and the MS. is somewhat imperfect.—BIBLIOGRAPHY: C. G. Child, *Translation of Beowulf*; J. Earle, *The Deeds of Beowulf*; Morley, *English Writers* (vol. i.); W. J. Sedgefield, *Beowulf*; H. Pierguin, *Le Poème Anglo-Saxon de Beowulf* (1912).

END OF VOLUME I